OCTOBER 1961

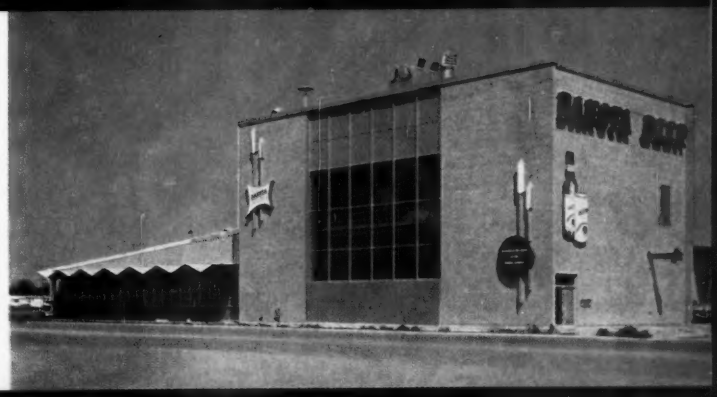
FOOD ENGINEERING

A CHILTON PUBLICATION

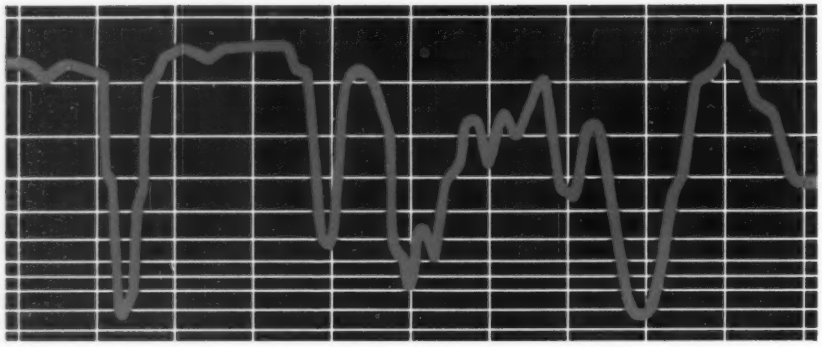
FOR BETTER MANAGEMENT IN MANUFACTURING

OUTSTANDING FOOD PLANTS

FE SPECIAL REPORT



The Molecule's Fingerprint



In human identification a fingerprint is regarded as an infallible characteristic of the individual. In chemical analysis a substance is characterized just as unmistakably by its spectrum. The use of spectroscopy as a modern means of quality control serves as a check on manufacturing and thus guarantees uniform quality. Spectroscopy has in addition become an indispensable tool in our physico-chemical research laboratories for both research and development.

We have published a booklet entitled "Absorption Spectroscopy", and shall be pleased to place it at the disposal of interested parties upon request.

DRAGOCO INC.

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FOOD ENGINEERING
FOR BETTER MANAGEMENT IN MANUFACTURING

VOL. 33 NO. 10

October, 1961

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Philip A. Hart

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FE Quizzes Senator Hart

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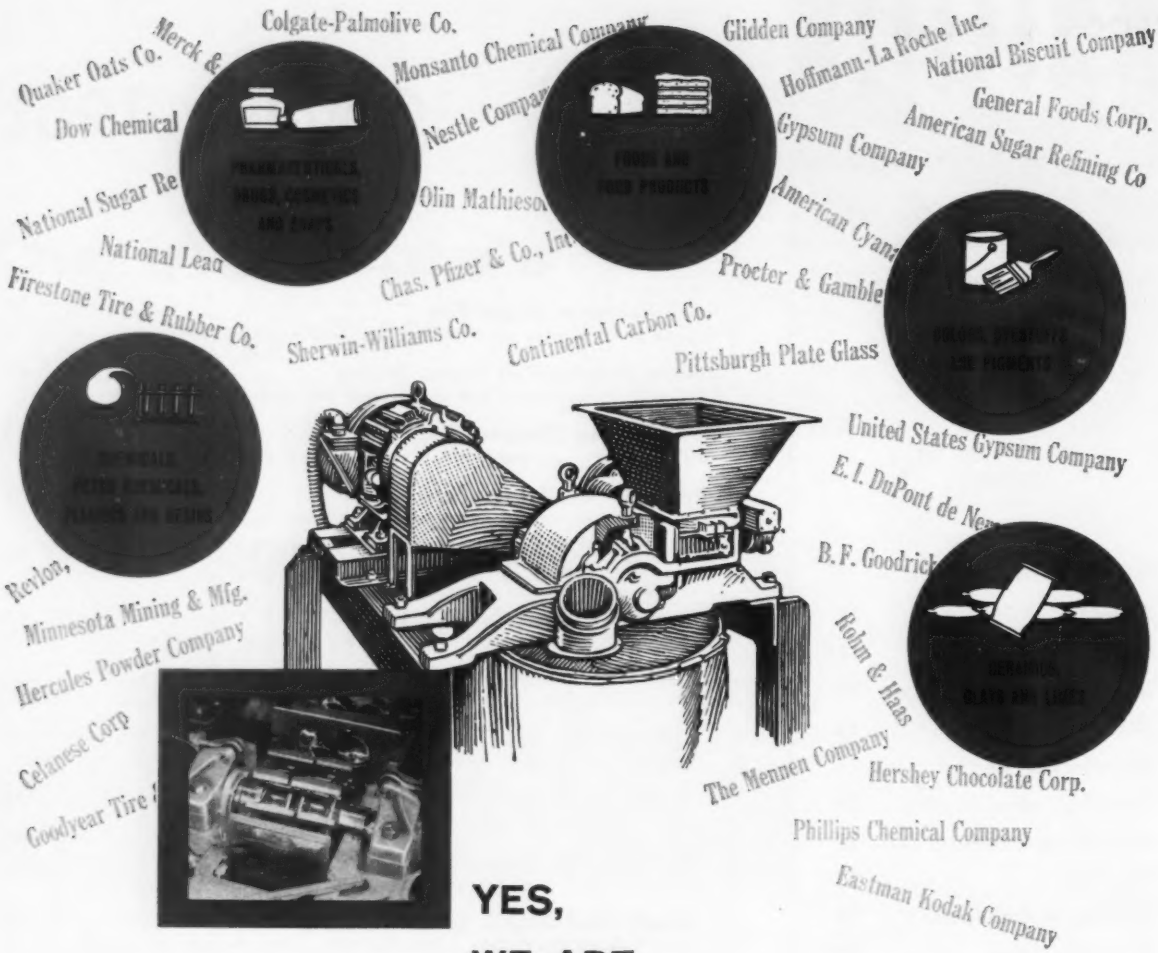

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Because we are proud of the customers who use MIKRO-PULVERIZERS . . .

In the montage of names that form the background of this ad you will find just a sampling from our published list of prominent MIKRO-PRODUCT users in the process industries. They represent companies of all sizes . . . all equally prized.

Each of these MIKRO-PULVERIZER owners operates a unit with a distinct individuality . . . an internal mechanism adjusted to handle a particular job either in dry-grinding or wet milling.

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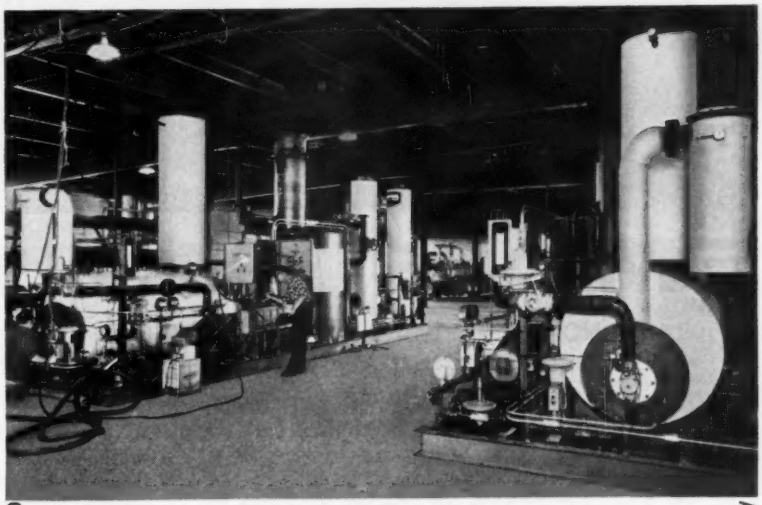
PACKAGED GAS GENERATORS PACKAGED GAS GENERATORS PACKAGED GAS GENERATORS PACKAGED GAS GENERATORS

EVEN THE BIG ONES ARE FACTORY ASSEMBLED AND THOROUGHLY TESTED AT GAS ATMOSPHERES

The pair of 10,000 cfh high-purity nitrogen generators pictured below is undergoing complete factory testing prior to shipment to the customer. This is standard practice at Gas Atmospheres.

GENERATORS MUST EXCEED SPECIFICATIONS in production, gas purity, and dryness. This rigorous testing assures buyers of quick and easy start-up without job-site disorder, and it cuts servicing and maintenance to the bone.

GAS ATMOSPHERES ORIGINATED PACKAGED GAS GENERATION SYSTEMS by increasing the productivity of various components, consolidating operations, and designing the unit into as compact an area as possible. This means smaller generators today produce greater volume, and the entire unit can be factory assembled on a common base and shipped and installed as a complete unit.



Two compact 10,000 cfh high-purity packaged nitrogen generators on test floor at Gas Atmospheres Assembly Plant.

IF YOU USE GAS, EVEN IN SMALL AMOUNTS, it might pay you to produce your own with a modern gas generation system. It costs nothing to have your operation checked out by America's foremost designer and builder of packaged gas generation systems. Just call or write *Gas Atmospheres, Inc., 3855 West 150th Street, Cleveland 11, Ohio.*

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equipment for producing industrial gases

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THE PERFECT FILLER FOR OLIVES

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PEACHES
BEETS
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POTATOES
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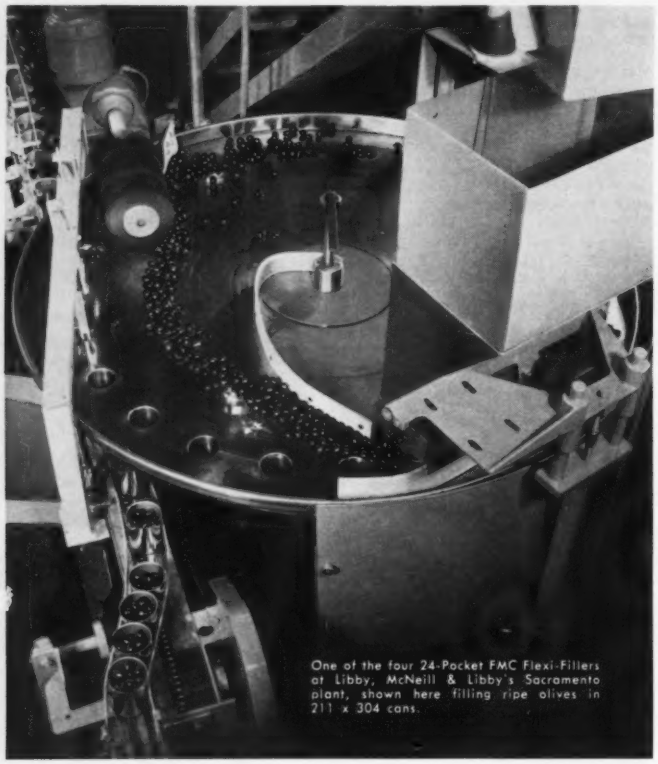
...and such specialty products as POPCORN, HARD CANDIES, NUTS and BLANCHED RAVIOLI



One of the four 24-Pocket FMC Flexi-Fillers at Libby, McNeill & Libby's Sacramento plant, shown here filling ripe olives in 211 x 304 cans.

FMC FLEXI-FILLER

NO OTHER MACHINE OFFERS SUCH COMPLETE FLEXIBILITY— IN PRODUCTS HANDLED, CAN SIZES, AUTOMATIC OPERATION

IF YOU PACK ONE PRODUCT OR A DOZEN, here's the filler that will give you the most in flexibility, efficiency and actual dollar savings in product, labor and maintenance. Now available in 12, 18 and 24 pocket sizes, the FMC Flexi-Fillers are quickly adaptable to semi- or fully-automatic operation on a broad range of can sizes, from 202 to 603 – at speeds up to 300 cpm, depending on the type of free-flowing, granular product and size of can. Check these profit-making features:

Individual cut-off gates move with the pocket, eliminating "dead plate" abrasion problems, and permitting a highly accurate pre-measurement into telescoping pockets – with no product damage.

Synchronized straight-line can travel greatly simplifies can handling. Cans are indexed positively under filling stations, in a fill-and-travel sequence. A modified arc in the line of travel permits the cans to be carried through 40° of filler's perimeter to ensure complete product transfer at high speeds without spillage.

Individual Pocket "No can-No fill" device automatically holds back the product flow unless can is properly positioned. Product waste is eliminated.

Cleaning up, no matter how frequent, is made easy because new completely sanitary design prevents product build-up, permits quick and thorough wash-down.

Write for details or call your nearest FMC representative. Do it today.

fmc CORPORATION

FMC CORPORATION

CANNING MACHINERY DIVISION

GENERAL SALES OFFICES: WESTERN—SAN JOSE, CALIF. · EASTERN—HOOPESTON, ILL.

TRENDS & FORECASTS

Continued improvement in business through balance of '61 and first half of '62 is forecast. Industrial production set new record of 112.4 on Federal Reserve Index (57=100) in July.

Crop production this year is estimated at 116% of '47-'49 average, 5 points below last year's record 121%. Corn is forecast 9.6% under '60, wheat, 10% less. Soybean prospects are up 29%.

Production of 8 vegetable crops for processing is put at 7.5 million tons, up 11% over '60, by USDA. Increases are: Sweet corn, 22%; beets, 21; green lima beans, 15; snap beans, 14; cabbage for kraut, 8; tomatoes, 7; green peas, 6.

Deciduous fruit crop is forecast 7% above '60. Crops of apples, sweet and sour cherries, and Northwest prunes are much larger.

Record production of edible tree nuts, 15% above '60, is forecast.

Per capita consumption of fruits rose 25% in 50 yr. to 200 lb. Processed fruit gained 5-fold and now about equals fresh.

Popcorn consumption gained 30% in year ending June 30. Harvest this year is expected to be about 30% greater than in '60.

Regular is consumed by 68% of coffee drinkers; instant, 22%; both, 10%.

Catch of fish and shellfish in first half of '61 totaled 1.69 billion lb., up 17% over year ago, Dept. of Interior reports.

Demand for freeze-dried food is exceeding United Fruit's expectations, and may be profitable for UF by end of year.

Canned applesauce will exceed 17 million cases, double 10 yr. ago, Processed Apples Inst. reports. About 35% of apples will be processed.

Vegetable consumption per capita is about 15% greater than 50 yrs. ago, USDA reports. There is shift from fresh to processed.

Cranberry crop is forecast 11% below '60, or 1.2 million bbl.

Soft drinks in cans are expected to increase 50% this year.

Homemakers in U. S. now get 67% of protein from livestock products, only 33% from cereals. It was 52% animal protein 50 yr. ago.

See Developments to Watch p. 15

SUPERESINS®

WILL *SLASH* YOUR COSTS

DRAMATIC SAVINGS are being made by large food processors and meat packers who have switched to FRITZSCHE'S new line of essential oil – oleoresin mixtures...

SUPERESINS®

When extended on a dry soluble carrier (such as salt or anhydrous dextrose), these carefully controlled, standardized materials replace the corresponding natural spices *pound for pound.* By using them, manufacturers can now *prepare their own dry soluble spices as needed,* thus eliminating the higher cost, bulk storage and deterioration problems often associated with the commercially made offerings. SUPERESINS® are made in our Clifton plant from the finest grades of selected spices and all conform to Federal Specifications EE-S-645. Examine the accompanying list and then write us on your letterhead for free test samples of those that interest you.

ALLSPICE
(Pimenta Berries)
BASIL
BLACK PEPPER
CAPSICUM
CARAWAY
CARDAMOM
CELERY
CINNAMON
CLOVE
CORIANDER
CUMIN
DILL SEED
FENNEL
GINGER
MACE
MARJORAM
NUTMEG
SAGE
THYME

The above SUPERESINS® *are available in 5 gal. (35 lb.) steel pails with pouring spouts and covers.*

FRITZSCHE BROTHERS, Inc.

A FIRST NAME IN FLAVORS SINCE 1871

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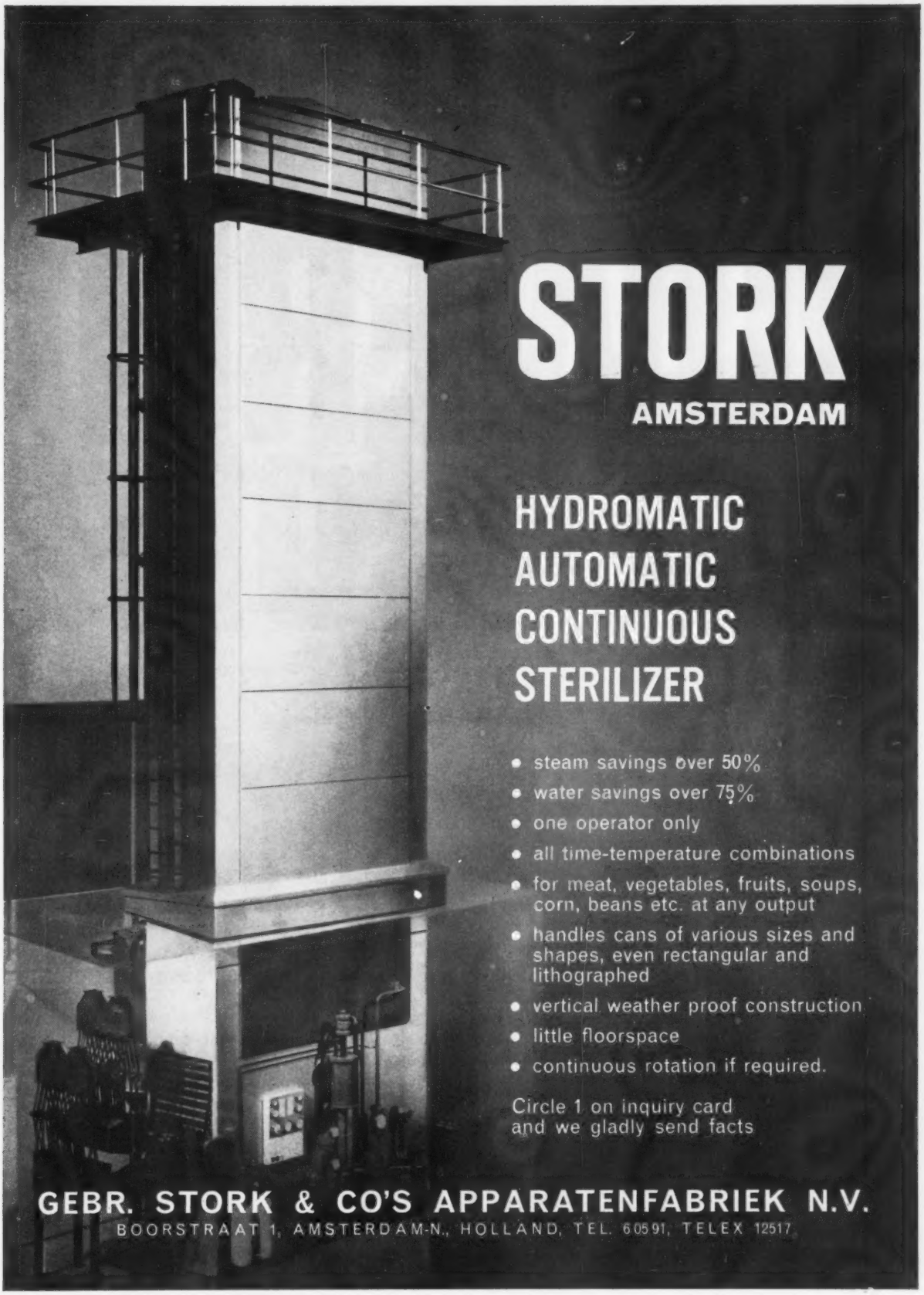
STORK
AMSTERDAM
HYDROMATIC
AUTOMATIC
CONTINUOUS
STERILIZER
• steam savings over 50%
• water savings over 75%
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• for meat, vegetables, fruits, soups, corn, beans etc. at any output
• handles cans of various sizes and shapes, even rectangular and lithographed
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• little floorspace
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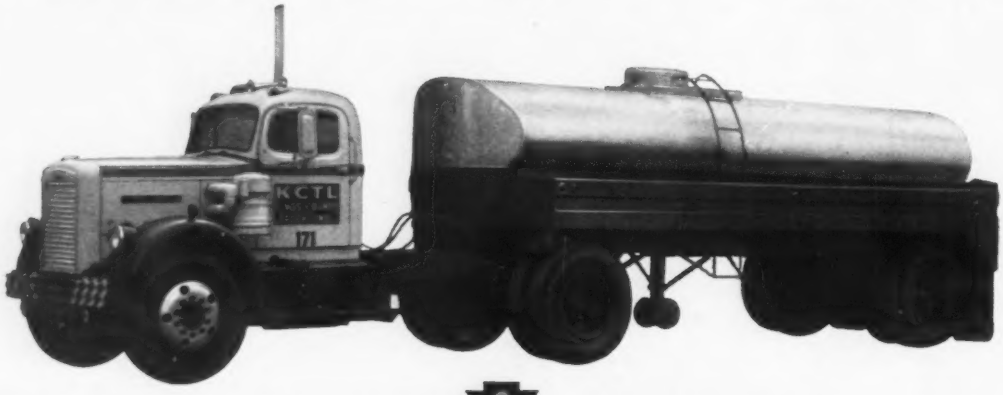
CUMMINS POWERED FOR PROFIT



Do as KCTL did; specify Cummins Stop & Go Diesels and increase your profits

"We are getting twice as many miles per gallon on the routes where we use Cummins *Stop and Go* Diesels. We have cut our fuel bills in half and have decided to switch entirely to diesel. We are specifying all Cummins." reports Manuel Mancebo, Sr., owner of Kings County Truck Lines, Tulare, California.

You too, can cut costs in *Stop and Go* delivery service! Cummins Diesels idle four to five times longer than gasoline engines on the same amount of fuel. Engine life is typically three to four times longer. Cummins Diesels save you maintenance time and expense because they have no carburetor or electrical ignition systems, the major causes of gasoline engine trouble.

You'll start earning more profit the day you start a Cummins. Repower your present truck or specify Cummins in your new equipment. Eleven *Stop and Go* models are available from 70 to 160 horsepower. For more information read the sixteen page brochure "*Stop and Go* Diesels by Cummins." For your free copy, call your Cummins Distributor or write **Cummins Engine Company, Inc., Columbus, Ind.**

CUMMINS

Schedule of Events

October

7-12—Baking Industry Exposition, Convention Hall, Atlantic City, N. J.

9-10—Nat'l Pickle Packers Assn., Meeting, Drake Hotel, Chicago.

15-17—Brewers' Assn. of America, meeting, Edgewater Beach Hotel, Chicago.

18-20—Packaging Institute, Annual Nat'l Forum, Biltmore Hotel, NYC.

19-20—American Society for Quality Control, meeting, Chase-Park Plaza Hotel, St. Louis, Mo.

22-27—Milk Industry Foundation & Internat'l Assn. of Ice Cream Mfrs., joint meeting, Washington, D. C.

28-N1—Nat'l Automatic Merchandising Assn., Internat'l Symposium, McCormick Place & Conrad Hilton Hotel, Chicago.

31-N1—Packaging Assn. of Canada, meeting, Automotive Bldg., Exhibition Park, Toronto, Canada.

November

5- 8—National Frozen Food Merchandising Convention & Exposition, Americana Hotel, Bal Harbour, Miami Beach, Fla.

7- 9—Point-of-Purchase Advertising Institute, McCormick Place Exhibition Center, Chicago.

7-10—Packaging Machinery Mfrs. Institute Show, Cobo Hall, Detroit, Mich.

13-15—Grocery Mfrs. of America Inc., 53rd Annual Meeting, Waldorf-Astoria Hotel, NYC.

13-16—American Bottlers of Carbonated Beverages, Internat'l Soft Drink Exposition, Brook Exhibition Hall, San Francico.

27-D1—Exposition of Chemical Industries, New York Coliseum, NYC.

HORS D'OEUVRES

One of the safest meats for picnics is the hot dog, says University of Michigan Medical Center. Bacteria that it doesn't fend off are singed in the campfire. It can't get ants in its pants, either—too tight.

Now that the cook-in-pouch is gaining favor, why not a cook-out pouch? Just light a match to the container to heat and make ready to eat.

Practically self-sufficient in food prior to World War II, East Germany has been a deficit food area under Russia. Seems that Commie corn often falls on barren ground.

Among the higher plants, cucumbers have been found most effective for converting carbon monoxide into harmless carbon dioxide. We better plant them in our city streets.

Housewives in Birmingham, England, don't have to plan meals. For a menu they just dial ASK 8071 phone-a-meal service. All they need now are instant meals.

Russian Spaceman Titov's orbital meal is said to have included soup, meat and liver paste, and black currant juice. Hardly worth going around the world even once for that.

Cuban grapefruit can be sold in the US if it meets the high standards set for Florida grapefruit. How subtle can an embargo be!

taste maker

FOR LIPTON SOUPS...

BAKON®

HICKORY-SMOKED YEAST...

Soup sippers are a fussy sort; they want both the rich green pea taste and an exciting blend of seasoning. Lipton finds that hickory-smoked BAKON YEAST helps provide a zestful bacon-like flavor and nutrition as well.

Food technologists appreciate the fact that BAKON is a Dried Torula Yeast, salt-free, and a carrier of 50% protein, the entire vitamin B complex, and the amino acids. Genuinely smoked BAKON is stable, uniform and contains no starch, sugar, or meat.

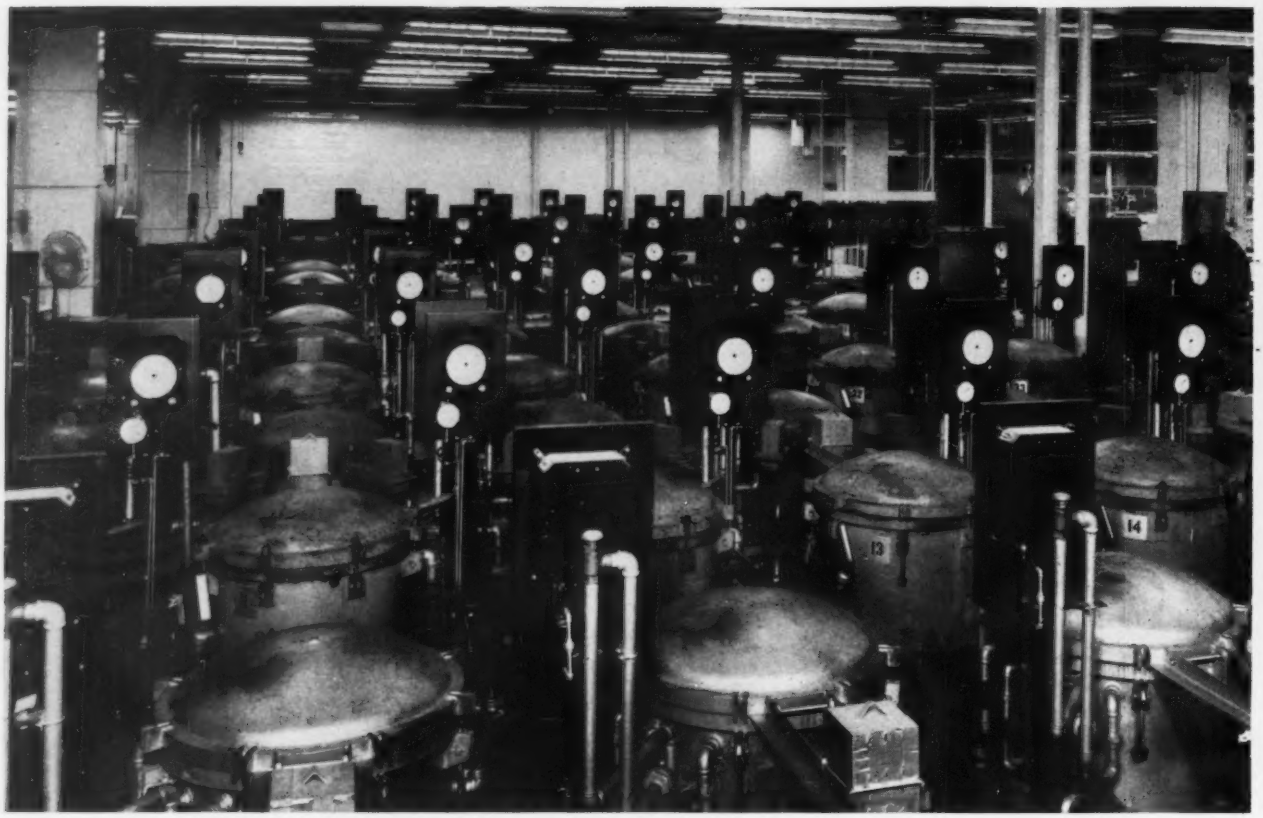
Discover for yourself why so many important food firms now incorporate hickory-smoked BAKON YEAST into their products for extra flavor and sales-appeal. BAKON is now used to flavor baby foods, nibbling foods, stews and vegetables, baked goods, sea foods, cheeses, spice mixes, and seasoning blends.

Send for your complimentary test sample of BAKON YEAST

Lake States

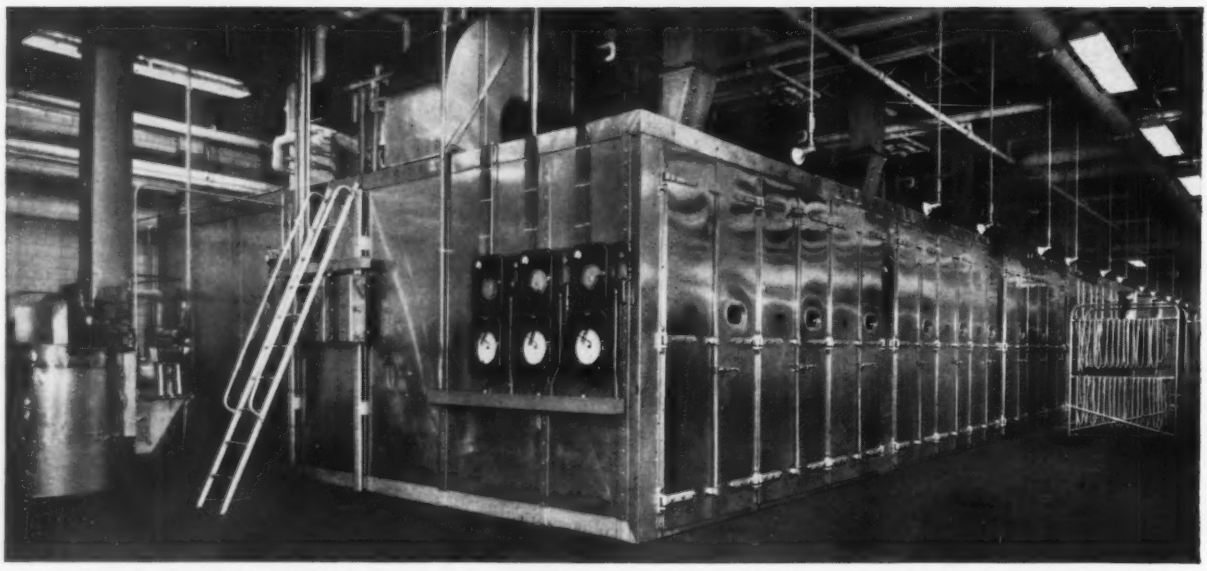
Manufactured and distributed for Bakon Yeast, Inc. by

Lake States Yeast and Chemical Division
of St. Regis Paper Company • Rhinelander, Wisconsin
Sales Office: 420 Lexington Ave., New York 17, N.Y.

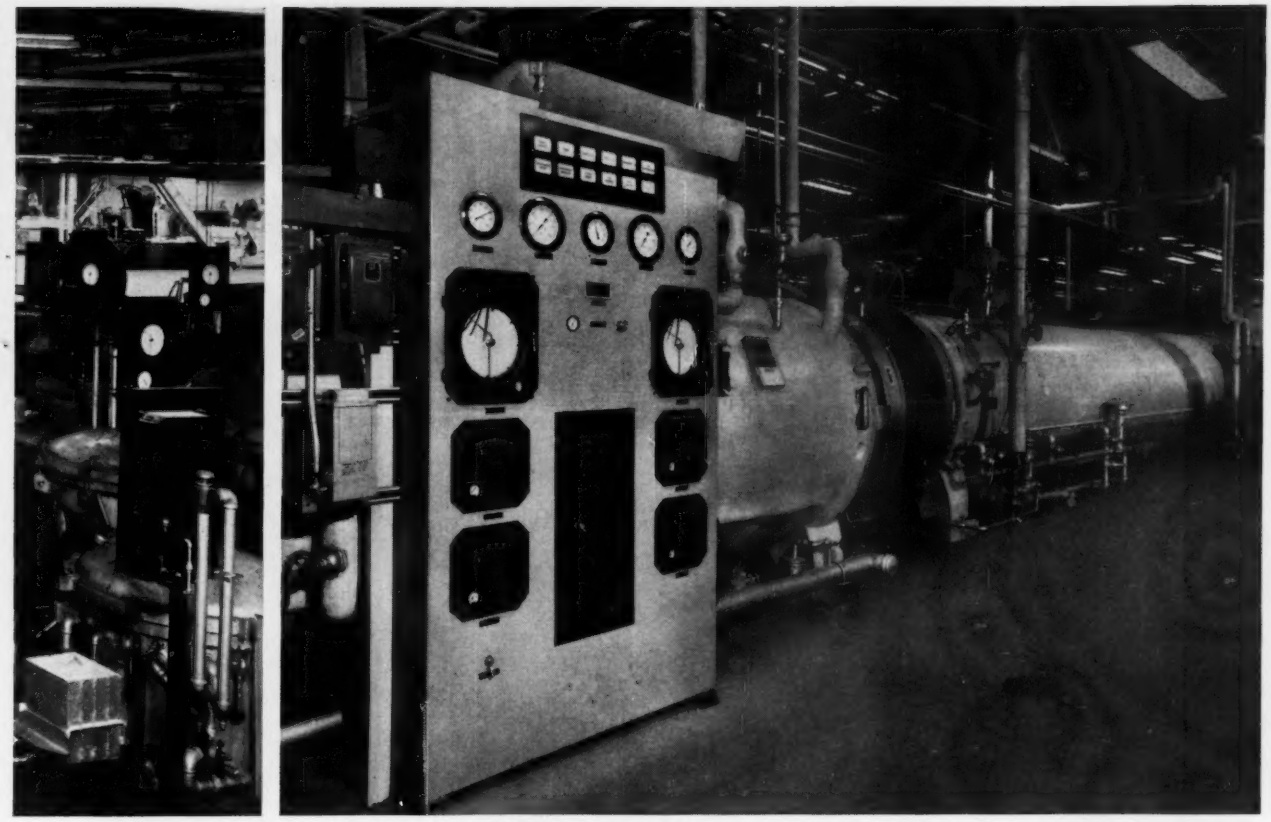


At Libby's Morgan Park plant, Taylor automatic Steam Cook Control Systems maintain exact processing temperatures in 96 retorts; eliminate the possibility of over and under-sterilization; provide a permanent record of cooking temperatures.

WHY *Libby's* CHOSE



Push-button automatic Smokehouse Control System regulates both wet and dry bulb temperatures within these 6 Julian smokehouses. Time schedule control brings temperatures up, maintains desired number of hold periods and automatically shuts off.



One of three Taylor-controlled Food Machinery and Chemical Corp's, Continuous Sterilmatic Pressure Cooker Cooler lines. The system maintains precise temperature control, including safety interlocks to insure adequate sterilization at all times, and temperature control during cooling.

Taylor's CONTROL SYSTEMS

For many years Libby, McNeill & Libby have relied on Taylor instrumentation for dependable quality control. In their new plant at Morgan Park, Chicago, processing operations have been automated for maximum efficiency and highest possible quality . . . hence the impressive array of Taylor systems shown in these pictures.

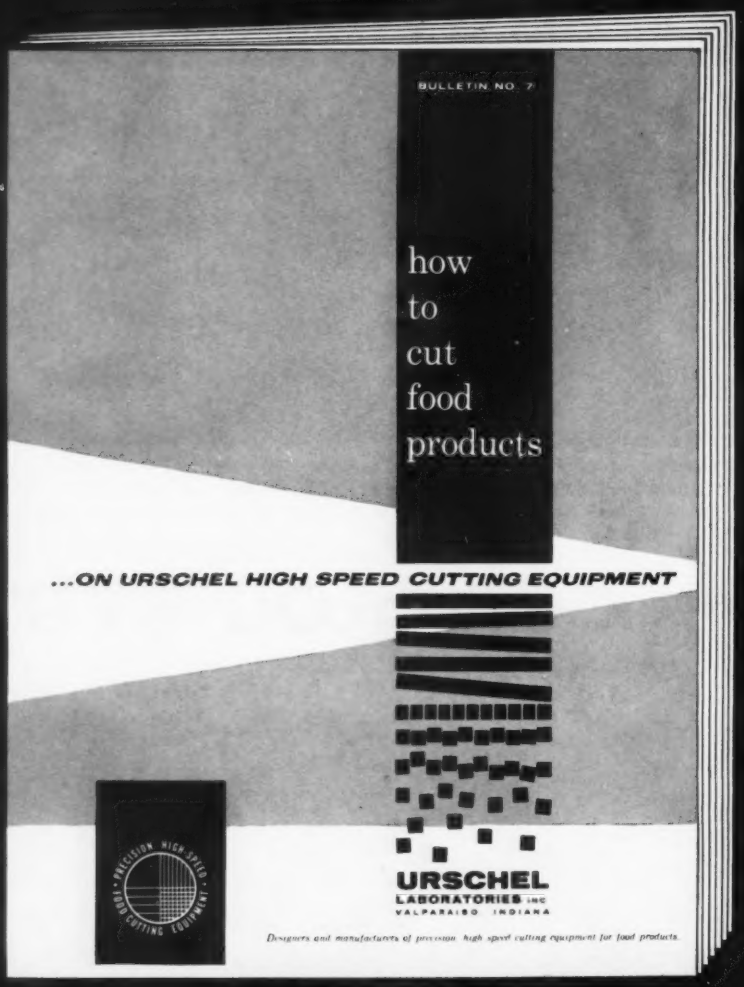
Among the top quality products under Taylor control at Morgan Park are Libby's Beef Stew, Spaghetti and Meat Balls, Vienna Sausage and Deep-Brown Beans. Libby's report all systems working to their complete satisfaction. Operator attention time has been cut to the minimum; spoilage is negligible; quality control is excellent.

When you're ready to modernize or expand, why not draw on Taylor's years of experience in serving the food processing industries. Your Taylor Field Engineer is well qualified to advise you. Or, if you prefer, write for *Catalog 500*. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Ontario.

Taylor Instruments MEAN ACCURACY FIRST

Cutting keeps changing ...so does our book*

IT WAS JUST REVISED



Write for this new book today to:

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LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

DEVELOPMENTS TO WATCH

Revolutionary new machine makes 2,000 cans per min. from aluminum or tinplate. It forms continuous ribbon of metal into tube, welds sides, cuts tube into can lengths. American Can development.

New $20 million packaging research complex built by Continental Can in Chicago and Plainfield, Ill., covers 13 acres. It houses 800 scientists and technicians, and speeds research through teamwork.

Mylar-foil-vinyl pouch that can be retorted conventionally is being test-marketed by Continental Can. Tomato paste may be first product in 5-oz. package, with other acidic items to follow.

New space-food can has plastic piston inside bottom. Plunger device fastens to bottom, breaks scored metal, forces piston up to expel food. Continental Can idea.

Packaging materials coated with polyvinylidene chloride latex now are available. Plastic coating is outstanding barrier to moisture, gases, greases, National Starch reports.

Cod steaks are freeze-dried in Canadian tests. Half-inch slices dry in 10 hr at 80F. Spiked plates and radiant heating are used.

New beverage made of apple juice and eggs will be test-marketed by Cornell. It meets most of morning nutritional needs.

Frozen apple juice concentrated 4-fold will be packed by Murch.

Bones in fish are automatically detected on moving belt at 25 fpm by Bureau of Fisheries experimental x-ray unit.

Ice cream hardening innovation is large bed of live roller conveyors suspended 18 in. from ceiling of conventional hardening room. Packages are pushed from conveyor belt onto rollers automatically.

Armour will spend $15 million to build new plants for production of fabricated ready-to-cook meats for institutional trade.

See Who's Building What p. 16

Feasibility of preserving seafood by nuclear radiation would be investigated under $1 million program proposed to AEC by MIT.

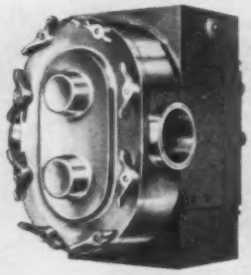
Washington Report p. 21

Canned meat retorted at low-temperature can be kept from spoiling by sulfur dioxide and bisulfite, University of Florida reports.

X-ray mutation has created new grape variety whose clusters are self-thinning. It resembles early, white, seedless Perlette.

THERMOVAC

"TP" PUMP
(A WAUKESHA PRODUCT)



... can replace any pump in your system!

The ideal standby pump—installs with drive shaft UP—DOWN—or SIDE-MOUNTS with equal versatility. The recognized efficiency and sanitation features of a WAUKESHA PUMP *are combined with the added versatility* of the THERMOVAC UNIVERSAL MOUNT—to give you a superior pump that installs quickly and easily in any desired position!

AND, for even faster changeover

THERMOVAC

"TC" Snap Clamps

Sanitary, stainless steel clamps, for use with "Tri-Clover" ferrules, snap on quickly for positive leak-tight connections—and snap off with a flick of the wrist. Quick-Set hand-adjustable feature allows precise fitting under the most exacting conditions, without tools—*makes all line-changing a snap!*

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Who's Building What

Monthly Reports: These food firms will spend $17,425,022 for expansion.

Contracts Awarded

Blitz-Weinhard Co., Portland, Ore., brewery addn., $300,000.

Canada Safeway Ltd., St. James, Man., cheese & egg plant addn., $200,000.

Coca-Cola Ltd., Windsor, Ont., plant, $141,000.

Delmonico Foods Inc., Louisville, Ky., plant, $219,000.

Fadler Produce Co., Tulsa, Okla., warehouse, $300,000.

Food Marketing Corp., Fort Wayne, Ind., distribution center, office, warehouse, perishable storage plant, $1,500,000.

Genteaume & McMullin Inc., Roxbury, Mass., bakery addn., $114,000.

Henry Heide Inc., New Brunswick, N. J., candy plant, $2,000,000.

Home Milk Producers' Assn., Miami, Fla., ice cream plant addn., $186,705.

Kauffmann Food Service, St. Louis, Mo., food processing plant, $200,000.

Red Deer Packers Ltd., Red Deer, Alta., plant, $481,632.

Safeway Stores Inc., Oklahoma City, Okla., ice cream mfg. plant, $247,685.

Proposed Projects

Cabell's Dairy Plant, Tyler, Tex., milk processing plant, $150,000.

Downyflake Foods, Allentown, Pa., frozen food processing plant, $1,500,000.

Eastern States Farmers' Exchange, Auburn, Me., egg plant, $200,000.

Peter Eckrich & Sons Inc., Fort Wayne, Ind., meat processing plant, $1,000,000.

Gregg's Cookie Co., Birmingham, Ala., plant, $200,000.

John Labatt Ltd., Toronto, Ont., brewery, $8,000,000.

Maryland & Virginia Milk Producers Assn., Newport News, Va., bulk milk producing plant, $250,000.

Meyer's Bakery, Little Rock, Ark., warehouse, $125,000.

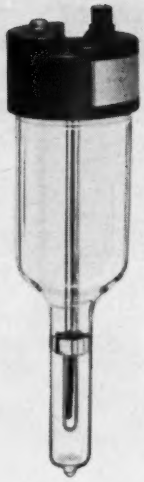
C. Schmidt & Sons Inc., Norristown, Pa., boiler house, $110,000.

Other Construction News

Campbell Soup's Mexican Div. plans construction of a multi-million dollar food processing plant in Villagran, Guanajuato, Mexico.

Thomas J. Lipton Inc. begins construction of a new plant in Independence, Mo. for production of Wishbone salad dressing, firm's '57 purchase.

FOOD RESEARCH LAB & PILOT PLANT is presently under construction by Armour & Co. in Oak Brook, suburban Chicago. Building will be center for development work on new and improved meat, dairy, poultry, and shortening products.



...with new rugged 7" reference and 3¾" glass electrodes...

new industrial pH system stresses reliability, flexibility

Beckman, world leader in pH instrumentation, introduces the all-new Model J pH System: compact transistorized analyzer, short, rugged electrodes, and accessory mounting assemblies. Here's continuous analysis equipment which provides reliability, flexibility, and convenience never before possible in industrial applications.

Check these Model J features, then see your Beckman Sales Engineer or Recorder Company Salesman for complete details, or write for Data File 18-10-06.

READOUT FLEXIBILITY. Available with both ma and mv output for use with any potentiometric or current recorders and controllers–or, with mv output only–recorder scale may be expanded to any 2 pH span full-scale. High or low alarm feature may be added.

SOLID-STATE ELECTRONICS. Assures reliability and saves long-term maintenance costs.

QUICK-DISCONNECT ELECTRODES. Short, rugged glass and reference electrodes feature capscrew for quick connect-disconnect of spade lug connectors. Speeds installation and replacement of electrodes.

DRIFT-FREE OPERATION. AC chopper amplification provides stability of 0.01 pH/24 hrs. over a −20°F to +122°F ambient temperature range.

HIGH ACCURACY AND SENSITIVITY. Output accuracy and meter sensitivity is ±0.02pH for full 0-14 pH or 0-±1400 mv range.

SIMPLIFIED MAINTENANCE. Plug-in components and circuits, rail-mounted analyzer chassis assure ease of maintenance, reduce downtime.

MINIMUM PANEL SPACE. Compact analyzer complements miniature current recorders, mounts in 6″x6″ cutout.

ACCESSORIES FOR YOUR REQUIREMENTS. Variety of flow chambers and immersion and submersion units adapt Model J System to your present and future plant applications.

Beckman INSTRUMENTS, INC.

SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION

Fullerton, Calif.

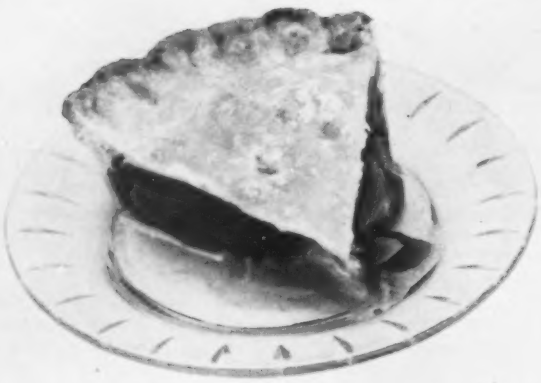
CIRCLE 17 ON INQUIRY CARD

CANNED VEGETABLES
Prevents pre-processing browning

FRUIT DRINKS
"Peps up" as an acidulant

BABY FOODS
Improves palatability

BREADED SHRIMP
Slows enzyme action;
reduces bacterial growth



FRUIT PIE FILLINGS
Increases fruit content;
improves flavor

CANNED SOUPS
Enhances flavor

CANNED FIGS
Reduces autoclave temperature; improves flavor and texture

MAYONNAISE
Extends shelf life

PRUNE JUICE
Accents flavor

VEGETABLE JUICE COCKTAIL
Adjusts acidity; improves flavor

What can lemon juice do for your product?

These are a few of the processed foods that *look* better, *taste* better and *sell* better, thanks to Exchange Concentrated Lemon Juice.

They range from ocean bottom seafood to treetop fruit.

Your product may be one that can be transformed from "good" to "superior" by the use of lemon juice as a flavor enhancer. Loss from spoilage or discoloration can often be cut—even eliminated—by using it in processing.

Exchange Lemon Juice can be a selling ingredient of distinction on your label at a cost of just pennies. Tell us what your product is. We'll tell you if and how lemon juice can improve it. Just use the coupon.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St.
Ontario, California

GENTLEMEN: *Our product is* _____

_____

_____. *How can lemon juice help?*

NAME _____

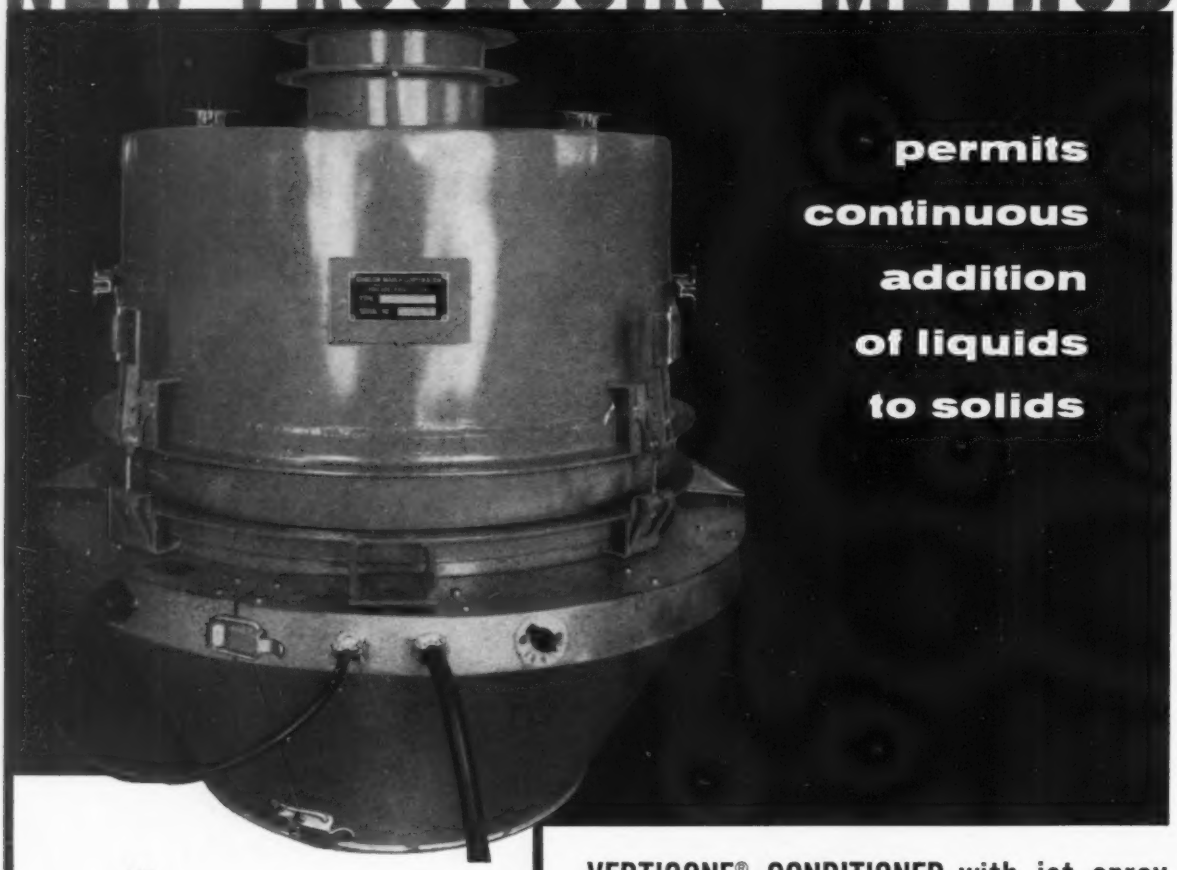
ADDRESS _____

CITY _____ ZONE _____

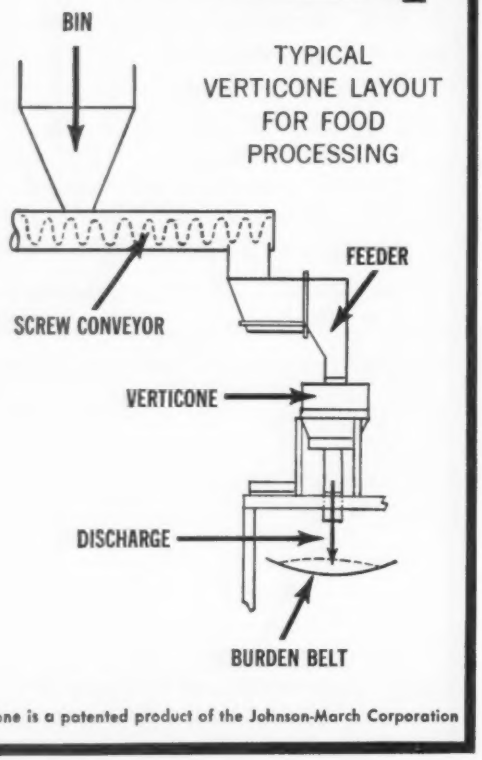
STATE _____

Exchange

NEW PROCESSING METHOD



permits continuous addition of liquids to solids



Verticone is a patented product of the Johnson-March Corporation

VERTICONE® CONDITIONER with jet spray coats or impregnates particles, granules or powders without degradation.

• lowers costs • improves quality • handles moisture and/or pressure sensitive materials • capacities from 300 lbs. to 150 tons per hour • speeds production

in food processing Some of the food industry applications in which Verticone has demonstrated its efficiency are: moisture in grain processing, aromatic oils to instant coffee, animal fats and syrups to dog food, protein extracts to animal feed, coloring and flavors to sugar, color to salt, liquids to cereals.

The services of Johnson-March engineers and the new Johnson-March test center are available to help solve your material conditioning problems. Write today for information on Verticone and tell us about your problem in the application of liquids to solids.

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← CIRCLE 19 ON INQUIRY CARD

CIRCLE 20 ON INQUIRY CARD

Washington Report

FTC takes the 'fifth' . . .

Trust-busters in disagreement

. . . Zero-Day nears

FTC's Paper Tiger

Tough-talking Federal Trade Commission took the Fifth Amendment route when Armour challenged the commission's mail order probe of food industry promotion payment practices. When Armour went to the courts to defy an FTC Sect. 6 request for data, the commission declined to press its case.

Although FTC refused to say why, it was believed that the commission was not ready for a court test of Armour's contention that meat packers are under USDA's Packers & Stockyard Act jurisdiction, hence exempt from FTC's rule. **However, with Secty. Freeman beefing up P&S enforcement, there was no guarantee that USDA may not carry out FTC's probe on its own.** Also, since P&S Act covers "meat food products," it's possible that other packers may follow Armour's course.

Anti-Chain Bills Falter

Passage chances of proposed bills to bar further chain store integration in meat packing appeared dim as result of testimony before a House Agriculture subcommittee. USDA, explaining it is making its own survey of the subject, declined to support HR 3415 (Anfuso) and HR 3798 (Roosevelt).

American Meat Institute testified that since it was against consent decree restrictions placed on the larger meat packers it couldn't do an about face and support similar type curbs on food chains. While several small business "spokesmen" appeared in support of the bills, none could cite specific instances where chain store expansion had hurt meat packers.

Gov't. Tightens Up Food Buying

Food sales to all military services will now be made through a single buying agency. Defense Supply Agency, under Lt. Gen. Andrew T. McNamara, will purchase items common to all the services. Operating out of the Pentagon, Agency will assume all the functions now performed by subsistence managers.

Enforcers Split Over Discounts

Pressure continues to build up for a law requiring food manufacturers to give functional discounts to wholesalers. However, FCT and Justice Dept. now take different positions towards the proposals.

Reversing the FTC's long-standing opposition, Chrmn. Dixon told a House subcommittee that HR 3465 could work if discounts were fixed on an industry-by-industry basis. However, Asst. Atty. Gen. Loevinger reiterated Justice Dept. opposition to the proposal on the grounds it would clash with Robinson-Patman and Sherman Acts. To provide price equilibrium at retail level, Loevinger argued, manufacturers would have to give disproportionate discounts to wholesalers. **This could be construed as a "vertical price fixing conspiracy," he added.**

Consumerism a Big Time Thing

A Federal "watchdog" to shelter consumers from the cold drafts of the marketplace is still a New Frontier objective. Bickering among News Frontiersmen as to who should get the ripe plum has delayed Pres. Kennedy from carrying out a pre-election pledge to create such a post.

Originally, Administration favored White House level post, now feels that existing agencies should put more stress on consumer protection. A new report shows that 22,000 full-time Federal employees, backed by an outlay of $272-million, are devoted to such activities. USDA spends the most, $74.8-million, with HEW, which includes FDA, as runnerup, with $72.5-million.

FDA Eases Up on Relabeling

Snow Crop escaped having to relabel its entire frozen orange juice pack. FDA had objected to SC label claim "equal to juice of up to 12 oranges," contended that "up to 6 oranges" is more likely.

Agency relented when processor pointed out the impossibility of relabeling lithographed tins and the financial loss that would be incurred in recanning. However, SC agreed to delete the claim from advertising copy as well as work up a new label for the forthcoming new pack.

The National Frozen Food Assn. suggested that concentrators do a survey of housewives to determine how much juice homemakers squeeze out of their oranges.

Zero Code Nears

Local food and drug officials will soon get the "official" recommendation for the proposed zero code being pushed by the Assn. of Food & Drug Officials of the U. S. It will be published in the January issue of the association's quarterly bulletin.

Although only a "recommendation," the code is likely to be adopted by most states. In general, it calls for less tolerances than the food and transportation industries feel justified.

Reprints of the code in final form will be available from Joseph F. Lakey, secty.-treas., AFDOUS, P. O. Box 9095, Austin, Texas.

(Turn page)

No area can be all things to *all* industries. But we've got down-to-earth facts that prove the Toledo-Northwestern Ohio area is right for Food Processing Industries. These facts are reported in a study of the area by Fantus Research, Inc., one of the nation's foremost industrial location services. If you would like to evaluate this information in terms of your plant location plans, write R. E. Johnson, Manager, Industrial Development Department, The Toledo Edison Company, Toledo 1, O.

THE TOLEDO EDISON COMPANY
an investor-owned electric light and power company serving Northwestern Ohio

Washington Report *(Continued)*

Work On Additives "Bible"

An authoritative reference guide on the safe use of food additives is the joint target of National Academy of Sciences' Food Protection Committee and the Toxicology Study Section of the National Institutes of Health. Expected to take about 5 yrs., the project is aimed at coming up with something similar to the U. S. Pharmacopeia. To be called the National Food Chemicals Codex, the guide will be an information source on methods of analysis, standards of identity, and purity of chemicals used in foods.

BRIEFS

Whistle-blowing made easier: Small-size outfits who want to complain about alleged unfair practices of competitors can now take their claims to any of 59 Small Business Administration offices who will then pass the complaints on to the FTC.

Consumer price index will use 1957-59 as the base period beginning next Jan. Move is in line with Budget Bureau recommendation that Federal agencies convert to that base, instead of the 1947-49 period, now used, for general purpose index numbers.

Critical supply situation of soft red winter wheat will be worsened by USDA's authorization of exportation of 65,000 tons of the grain to Turkey, biscuit and cracker makers point out.

A tougher National Labor Relations Board policy against unfair labor practices is promised by Chrmn. Frank W. McCullock. He says board is studying ways "to take the profit out of such practices" whether committed by employers or unions.

Long awaited food standard for vanilla extract will be issued before the end of the year, according to FDA officials. At issue is recommendation by McCormick Co. that amount of vanilla bean be expressed on solids basis, with other firms proposing that vanilla bean weight represent the whole bean with moisture included.

FDA Standards of Identity:

Cereal Flours and related products may now include the addition of acetone peroxides to the list of optional ingredients permitted for bleaching and artificial aging effects.

Fish Protien Concentrate and whole fish flour has been sighted by FDA for a definition and standard of identity. According to FDA, the product, used as a source of protien, should be regarded as an adulterated article because it is made without removal of those portions of fish that are not normally acceptable for human food in the U. S. Proponents of the product, however, contend that if consumers generally were fully informed of the nature of the article, they would regard it as suitable for use in their food supply.

Coarse Crystal Sodium Chloride has been named for proposed regulation to establish tolerance of 10 parts/million (0.001%) of the surfactant polysorbate 80 when used in its production. Proposed by Diamond Crystal Salt Co.

Cheese (Swiss, Blue, and Certain Italian Styles) has received standards revision. Artificial coloring is now a permitted optional ingredient of swiss and blue cheese. Benzoyl peroxide is a permitted ingredient for bleaching milk used to make certain Italian style cheeses.

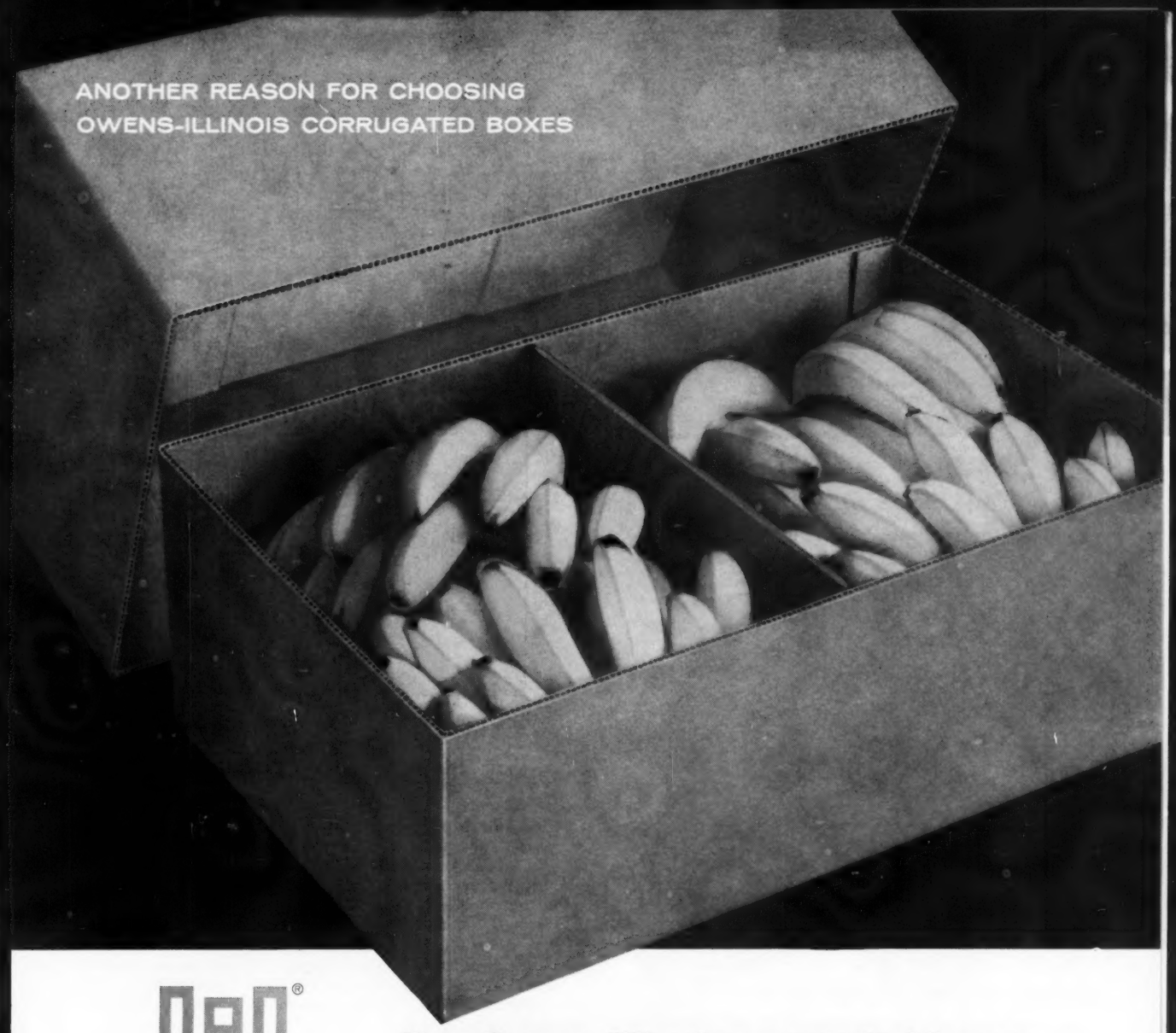
Revised USDA Standards:

Cheddar Cheese will be offered this month, in some parts of the country, labeled with U. S. Grade AA shield. USDA granted first authorization for use of AA grade mark to Lake Dairy Cooperative, Manitowoc & Kiel, Wis., a manufacturer, and to Land O' Lake Creameries, Inc., Minneapolis.

Federally-Graded Meat, of foreign origin, will be required to bear an approved mark identifying the country of origin, under a proposed amendment to regulations governing meat grading activities of the Agricultural Marketing Service.

Poultry Meat Requirements for soups and soup mixes has been set at two percent minimum for chicken or turkey soups on a ready-to-serve basis. New USDA regulation pertains to all soups (condensed, canned, or dehydrated) that are prepared under Federal meat inspection.

Fresh Tomatoes have received standards revision to provide for better descriptions of tomato color. New descriptive terms to be used are: "green," "breakers," "turning," "pink," "light red," and "red." Inspectors had used terms: "mature green," "turning," and "ripe."



MR. STRONGBOX

LOCALIZED SERVICE FROM:

Atlanta, Ga.	Long Island City, N. Y.
Aurora, Ind.	Los Angeles, Calif.*
Bradford, Pa.	Madison, Ill.
Bristol, Pa.	Memphis, Tenn.
Chicago, Ill.	Mercedes, Texas
Dallas, Texas	Miami, Fla.
Detroit, Mich.	Milwaukee, Wis.
Flint, Mich.	Minneapolis, Minn.
Jacksonville, Fla.	Newark, N. J.
Kansas City, Mo.	Oakland, Calif.*
Salisbury, N. C.	

*These plants are operated by National Container Corporation of California, subsidiary of Owens-Illinois.

How Owens-Illinois corrugated boxes offer bananas the protection they deserve

No longer is it necessary to subject delicate bananas to bouncing and banging on docks and in warehouses as they are when shipped on the stalk, in bulk.

These hands of bananas were pampered by an Owens-Illinois corrugated box from the time they were picked in Honduras until they were opened in New York City. Because these select, matched bananas keep their good looks, they produce more sales, more profit, less retail shrink.

This special box offers other advantages. It is 1) *disposable* (no deposits or pile-ups between pickups), 2) *compact* (reduces storage space by almost 50 per cent), and 3) its weight and dimensions make it ideal for handling.

Might a new approach be a better answer to your shipping problems?

FOREST PRODUCTS DIVISION
FORMERLY NATIONAL CONTAINER

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

CIRCLE 23 ON INQUIRY CARD

new packages

NEW METRECAL WAFERS

POLY BAG HAS HANDLE

TEA BAG DISPENSER

DISPOSABLE CARTON 'BOTTLE'

METRECAL WAFERS FOR NON-DRINKERS

Spice-flavored wafers, the first solid food addition to the Metrecal line of products for weight control, are being marketed by Edward Dalton Div. of Mead Johnson & Co.

Nine wafers are the nutritional equivalent of one 8-oz. glass of Metrecal liquid—a 225 caloried meal. Thirty-six wafers provide a complete day's diet of 900 calories. In appropriate quantities, wafers can be used with water or other liquid as a total diet, for one or two meals daily, or in combination with Metrecal liquid.

Suggested retail price is $1.19 for package of 36 wafers.

POLY BAG HAS BUILT-IN HANDLE

Zip handle, a polyethylene bag with a built-in carrying handle, is being used for candy products by the Hardesty Candy Co., Richmond, Va.

Bag is a bottom-gusset item, with design inverted, so that bottom becomes the top after loading. Gusset is serrated at a given point and handle is formed by gusset when bag is zipped open. Handle will not snag on edges or protusions prior to opening.

Supplier is Dobeckmun Div. of The Dow Chemical Co. (311)

DISPOSABLE CARTON FOR LIQUIDS

Liquatainer, a disposable carton with a pliable film liner, has been introduced for shipment of liquid or semiliquid products such as non-carbonated juices and drinks, fluoridated water, syrups, concentrates, and similar products.

Package consists of a pliable film bag engineered into a bleached food board carton. Chief advantage is that it eliminates return bottle problem. Other features include rectangular shape for optimum use of shelf space, convenient pour spout construction, and substantial savings in shipping, handling and delivery costs. Package contents can be frozen without damage.

Liquatainer is available printed in a wide range of colors to provide easy product identification. Supplier, Bemis Bros. Bag Co., has also designed and built a machine to fill and close the container. (312)

DUAL DISPENSER FOR TEA BAGS

Novel, bottom-serving tea carton is being used to dispense Stewarts Private Blend Tea, product of Stewarts Coffee Co., Chicago.

Carton has two openings: (1) a conventional lid at the top from which more than one bag at a time can be withdrawn; (2) a die cut slot at the bottom for convenient self-dispensing of individual servings.

Package, which dispenses the new flat "Full-Brew" bag, was designed by W. M. Ramsey, Stewarts Tea Div. general manager.

PLASTIC NETTING FOR PRODUCE PACKAGING

Increased shelf life for produce is claimed for Du Pont's "Vexar" plastic netting.

Supplier points to tests made on onions stored for four weeks at room temperature in both Vexar and

& products

PLASTIC NETTING TEST

PICTORIAL EGG CARTONS

SYRUP FROM LEVER BROS.

ZIP-CARTONED FISH PRODUCTS

standard perforated polyethylene. Onions in Vexar retained color and firmness with little or no sprouting, while those stored in poly sprouted and turned dark brown and soft (see photo).

Free movement of air, afforded by netting, gives hard-to-package produce enough ventilation to permit packaging even at grower level. Choice of netting colors is offered for point-of-sale appeal. **(313)**

PICTORIAL CARTONS BOOST EGG SALES

Increasing acceptance of pictorial egg cartons is demonstrated by Hillandale Farms Inc., Flushing, Ohio. Firm is collecting handsome dividends from their new full color pictorial carton, which also features premium coupon on the back.

The 4-color litho carton, illustrating a wire basket of fresh eggs, was designed and produced by Folding Carton Div. of Riegel Paper Corp. **(314)**

ZIP-OPEN CARTONS FOR NEW FISH ITEMS

Second stage of a new "hi-visibility" retail line has been announced by Blue Water Seafoods. Two new products, a 16-fish stick package and a 7-oz. scallop package, are contained in sealed wax cartons with zip-open tab for maximum convenience and strength.

Packages feature dramatic, bigger-than-life color photos of the product for maximum impact. Distinctive Blue Water blue background is punctuated with bold white letters that catch the eye and minimize any chance of shopper confusion. Full-sell back duplicates the front to permit both vertical and horizontal facings to fit any case situation.

BOTTLE HELPS 'SELL' NEW LEVER SYRUP

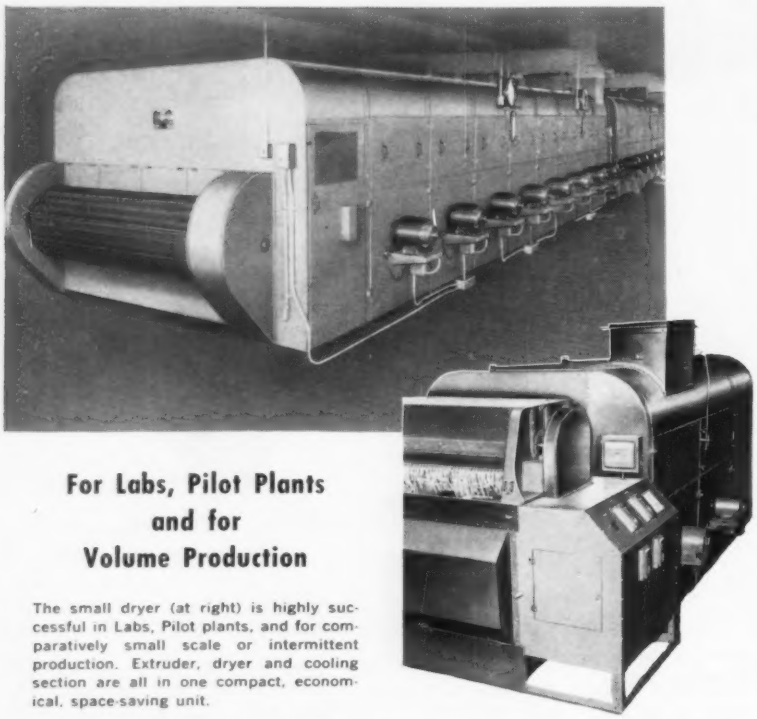
Mrs. Butterworth's Syrup, described as a "dramatically different maple-flavored syrup with an actual

FORMULA FOR PROFITABLE OPERATION

FOOD DRYERS by SARGENT

Generally, there are three approaches by a company to the selection of a process dryer — the engineering, the economic, and the important evaluation of the intangibles. We firmly believe that SARGENT will always be found on top from every approach, for many reasons, an important one being that our machines and our people consistently deliver as promised, and more. This is the SARGENT:

- A dryer designed for your process, your required production.
- Rugged construction, trouble-free economical operation.
- Highest quality, measurably uniform drying.
- Exclusive features for efficiency and safety.
- Highest quality, measurably uniform drying.
- A dryer designed for quick, easy cleanout.
- The bonus economy of the speediest, easiest installation of any machine on the market.
- Built by a company whose dryers lead the field — a company whose long experience makes a guarantee really mean something — a company that will say, "We stand unequivocally behind every machine we build."



For Labs, Pilot Plants and for Volume Production

The small dryer (at right) is highly successful in Labs, Pilot plants, and for comparatively small scale or intermittent production. Extruder, dryer and cooling section are all in one compact, economical, space-saving unit.

The 14-section, 2-stage dryer (above) is engineered for high tonnage per hour production. Extruder, or granulator, together with baking and curing and cooling sections may be added by incorporating the same housing, where desired. Heat source for any SARGENT may be gas, steam or electricity. Airflow may be up, down, or in combination.

SARGENT equipment is working wherever there's a drying process in the food industry, from milk curd to poultry stuffing and protein flour. They may be engineered for complete push-button control of the entire drying-cooling operation. They are always designed for your product and your production. May we tell you more?

C. G. SARGENT'S SONS CORPORATION

Graniteville, SINCE 1852 Massachusetts

PHILADELPHIA • CINCINNATI • CHARLOTTE • ATLANTA • HOUSTON • DETROIT
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CIRCLE 26 ON INQUIRY CARD

butter content," is currently being introduced by Lever Bros. Co.

Supplementing a huge advertising and promotion campaign is the glass package, itself, which features actual design shape of "Mrs. Butterworth."

TWO-WAY BOX for cookies from Arnold Bakers, Inc., provides both horizontal and vertical display possibilities as well as side or top-opening. Construction is paperboard with white opaque corrugated Glassine lining and dividers. Carton supplier is Bestpack, Inc. **(315)** with overwraps by KVP Sutherland Paper Co. **(316)**

New Product Shorts

Lawry's Foods, Inc., has introduced Seasoned Pepper, a blend of coarse black pepper, sweet red bell pepper, green pepper, plus a variety of selected spices and seasonings.

Trommers Brewing Co., a subsidiary of Piel Bros., is marketing "low calorie" Red Letter Beer. Firm says new beer contains fewer than 100 calories for each 12-oz. bottle, one-third less than the average beer.

R. T. French Co. has added instant mashed potato with milk solids to its institutional line. New pack (5-lb. 7-oz. tin) yields 150 servings and eliminates addition of milk.

Campbell raised its line of heat-processed soups to 29 with addition of two new items—Chili Beef and Vegetable Bean.

Packaging Briefs

Patented serpentine divider and an increased vertical depth are announced by Anaconda Aluminum Co. for its line of frozen dinner trays. New design adds extra strength and rigidity and permits greater variety in food arrangements. **(317)**

Dynasheen, a new cast-coated ultra high gloss wax finish, is being marketed by Weyerhaeuser's Boxboard & Folding Carton Div. Process for high lustre wax finish adds depth and clarity to color reproductions. **(318)**

CIRCLE 27 ON INQUIRY CARD ➔

New Brilliance...Added Protection for Kentucky Club Aromatic Mixture

New high-gloss plastic coating gives extra appeal to four-color gravure printing on Kentucky Club's plaid pouch. Now made with Riegel Pouchpak*, a coated/laminated paper that resists cracking in repeated foldings and refoldings and keeps tobacco fresher.

Making packaging ideas *work*... combining protection, eye-appeal and machine efficiency... this is Riegel's business. We've a flair for thinking of every product as something different... something special... and developing for it the one best packaging material, be it pouch paper, glassine, foil, film... or combination... printed, coated, or plain. Write for more information today... for the new ideas come from Riegel.

Flexible Packaging Division
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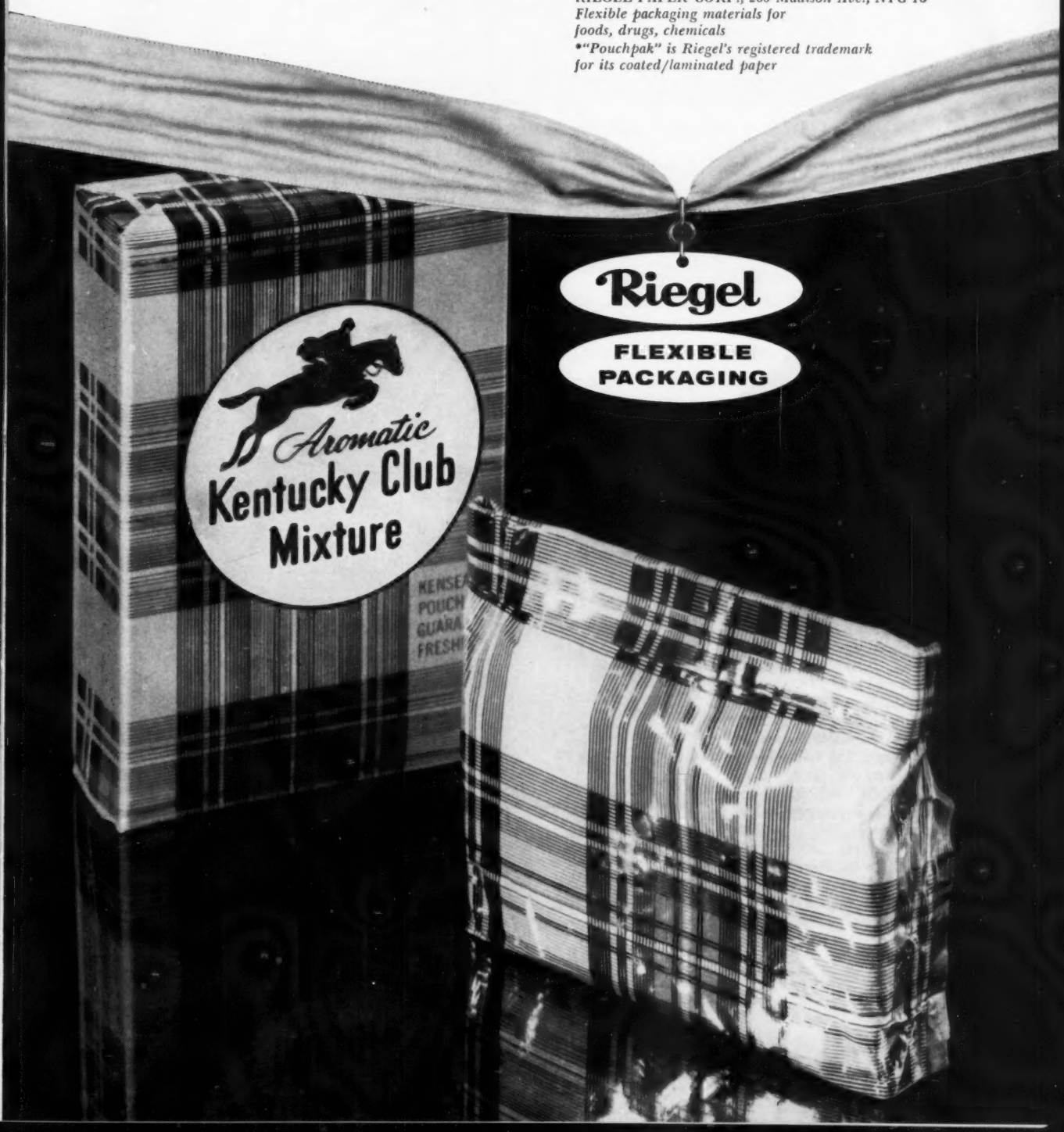
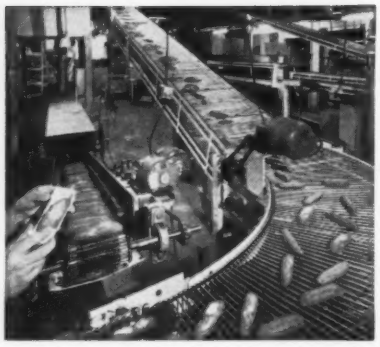
Flexible packaging materials for foods, drugs, chemicals
**"Pouchpak" is Riegel's registered trademark for its coated/laminated paper*



"WE HAVEN'T SPENT A DIME ON CYCLONE BELTS
SINCE WE PUT THE FIRST ONES IN 8 YEARS AGO.
I'D SAY WE GOT OURSELVES A BARGAIN."

That's what Francis Porambo, president of Franchett's Krullers, Inc., Elizabeth, N.J., had to say about his USS Cyclone metal conveyor belts. Franchett's three automatic cruller machines each turn out about 600 dozen crullers per hour, 14,400 dozen in the usual 8-hour day. Mr. Porambo says, "With our three machines, we've got just enough capacity to keep up with peak orders. The belts are the heart of the frying equipment; if they go we're in trouble. They've got to be rugged and well-engineered to keep working, sometimes 20 hours at a stretch. Cyclone has done such an outstanding job for us, there's no question about who will get first consideration the next time we need belts for any new equipment."



Here's a look at part of Franchett's 1000 feet of USS Cyclone conveyor belts. At left, you see crullers emerging from the fryer on a 9-gauge, tin-coated Flex-Grid belt. Size: 6"-wide by 12'-long. This belt is fed by an 8"-wide by 35'-long Equalized Spiral woven wire belt—18-gauge, Type 302 Stainless Steel. The Equalized Spiral is fed, in turn, by a 6"-wide by 7'11"-long Dual Weave belt—20-gauge, Type 302 Stainless Steel.

As the crullers reach the end of the 6"-wide Flex-Grid, they're automatically transferred to a 24" tin-coated Flex-Grid belt (right foreground) which takes them about 900' to the cooler. The cooler feeds the sugaring machine and then on to packaging. Trip time for a cruller: 40 minutes.

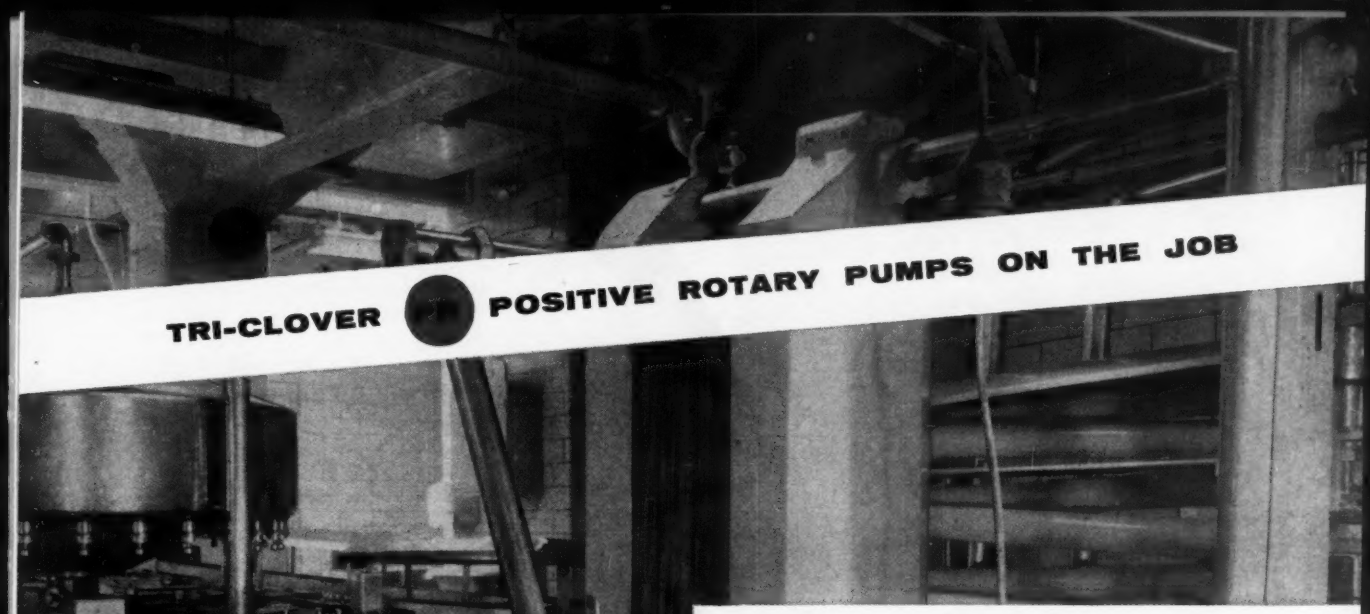
Next time you need a metal conveyor belt recommendation, give us a call. USS Cyclone makes more kinds of metal conveyor belts than anyone else in the world. Our service is the fastest in the industry. We've got 69 branch offices around the country to serve you. Wherever you are, we're reasonably close by. Check your Yellow Pages under "Conveyor Belts—Metal."

For strength, service, dependability.

American Steel and Wire
Division of
United States Steel

Cyclone Sales Offices Coast-to-Coast

USS



TRI-CLOVER POSITIVE ROTARY PUMPS ON THE JOB

. . . serving Borden Company plant at Mount Vernon, N.Y.

The Borden operation in Mount Vernon, New York, is typical of the ever increasing number of progressive dairy plants that are installing Tri-Clover Division's new "PR" Series Positive Rotary Pumps.

Here are some of the reasons for the popularity of this new Tri-Clover high efficiency series: *FLOATING IMPELLER DESIGN; STATIC SANITARY O-RING SEAL . . . FULLY ACCESSIBLE; BEARING AND GEARS LOCATED IN SEPARATE COMPARTMENTS FOR MORE EFFECTIVE LUBRICATION* . . . and a popular size range including capacities of 3, 10, 25, 60, 125 and 300 gallons per minute.

For complete details, write for the new Pump Bulletin "PR-260."

P461

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Kenosha Wisconsin

TRI-CLOVER

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EXPORT DEPARTMENT: 8 South Michigan Avenue, Chicago 6, Illinois
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NOW ALMOST TWO CANS FOR THE WEIGHT OF ONE!

Photo courtesy United States Steel

New lighter, thinner tinplate cuts can weight almost in half... lowers material costs... provides high strength and rigidity; offers all of the protective qualities and handling advantages of standard tinplate. Most major tinplate producing steel companies are either producing this new thinner plate now or will do so soon.

No other packaging material can match the combined characteristics and advantages of the tin can. Compare these points and see for yourself:

• economy • strength in any size • durability • no effect on taste of contents • noncorrosiveness • ease in mass handling without breakage • ease of display, stacking, stocking or storing • compactness • no light damage to contents

8 of every 10* TIN CANS are made with STRAITS TIN from MALAYA

Based on U.S. Bureau of Mines statistics for 1954-58 average

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Packaging Pointers

Big strides for food cans

. . . Cure for sameness . . .

Containers for space meals

New Advances for Cans

Suppliers of metal containers last month unveiled three technological improvements for food packers:

1) **An even lighter, thinner tinplate** was debuted by U. S. Steel. New grade, called Ferrolite 10, is 15¢/base box cheaper than the original thin tin introduced a year ago and has only half the weight of standard plate. Initial target: '61-'62 pack of frozen orange juice.

2) **A new can-maker that triples the speed of present machines** was announced by American Can. Technique, which fabricates cans from a continuous ribbon instead of the traditional blanks, is said by Canco to turn out 2,000 cans a minute vs. conventional 600/min. rate. Feasible for standard tinplate, thin tin, or aluminum, the first machine is slated for use in early '62. (See p. 95.)

3) A Japanese firm may invade the U. S. food container market with **chrome-plated steel stock** that, it says, will be competitively priced with standard tinplate and possess superior corrosion resistance, according to a report in The Iron Age, a Chilton publication. Magazine says the company claims a 10% cost reduction in fabricating.

Surveys Multiple Buying

Multiple purchases (more than one package of the same item bought at same time) account for one out of five (or 22.4%) of all shopper purchases. So discloses Du Pont de Nemours in the latest installment of its "6th Consumer Buying Habits Study" which polled 4,600 family shoppers in 225 supermarkets.

Frozen fruit and vegetable juices scored the highest multiple purchase rate, 76.9%, followed by canned soup, 71.4%. Other items with a 50% or better rate included canned milk, canned vegetables, dessert mixes, and baby foods. Lowest scores, less than 10%, were shown by several baked goods items, potato chips, processed meats, jellies, cereal.

Package's Role in Hot Vending

Race to develop suitable containers for the boom in hot food vending is warming up. Kaiser Aluminum & Chemical Corp. reports that two types of foil trays are now being used by Automatic Merchandising Co. for packaging all types of meals. One is a 3-compartmented tray, the other is without dividers for casserole items.

Meanwhile, Haveg Industries is readying a melamine-impregnated paper tray that can be used with infrared cooking operations and is suitable for low and high temperatures. Brass Rail is experimenting with the tray as part of its new franchise vending program.

Ending Look-Alike Problem

Success of premium-priced Arnold's and Pepperidge Farm breads has pointers for cake mix makers who are plagued by a packaging sameness, claims Dr. Ernest Dichter, head of Institute for Motivational Research. He suggests that cake mix producers consider these packaging innovations: 1) Rigid foil containers for added storage, protective, and reusability features. 2) Odd shapes such as circles, rectangles, and triangles that can be made smaller as product is consumed. 3) Name changes to link item with gourmet cooking idea.

Far Out Containers

Pure aluminum alloys seem to be the most feasible material for 6-oz. rectangular food packages for aerospace crewmen, according to an Air Force-sponsored engineering study. Required protective liners and adaptations of quick-opening devices can probably be drawn from canning industry techniques, the report adds. Special plastic mouthpieces and ejecting apparatus, as well as systems to prevent formation and explosion of gas within the containers, must be developed, the study says.

BRIEFS

How often should you change your label? H. J. Heinz alters, modifies, or redesigns completely every package at least once every 2 or 3 yrs.

A linerless cereal box with a built-in pour spout is being test marketed by General Foods.

High-frequency electronic welding that eliminates cemented side seams may make aluminum cans feasible for hot-pack foods, says Reynolds Metals.

Green Giant will build a second can-making line next year, will then be able to supply 87% of its own needs, company reports.

Some $15 million will have been spent by Glass Container Mfrs. Institute by the end of this year to promote handy beer bottles.

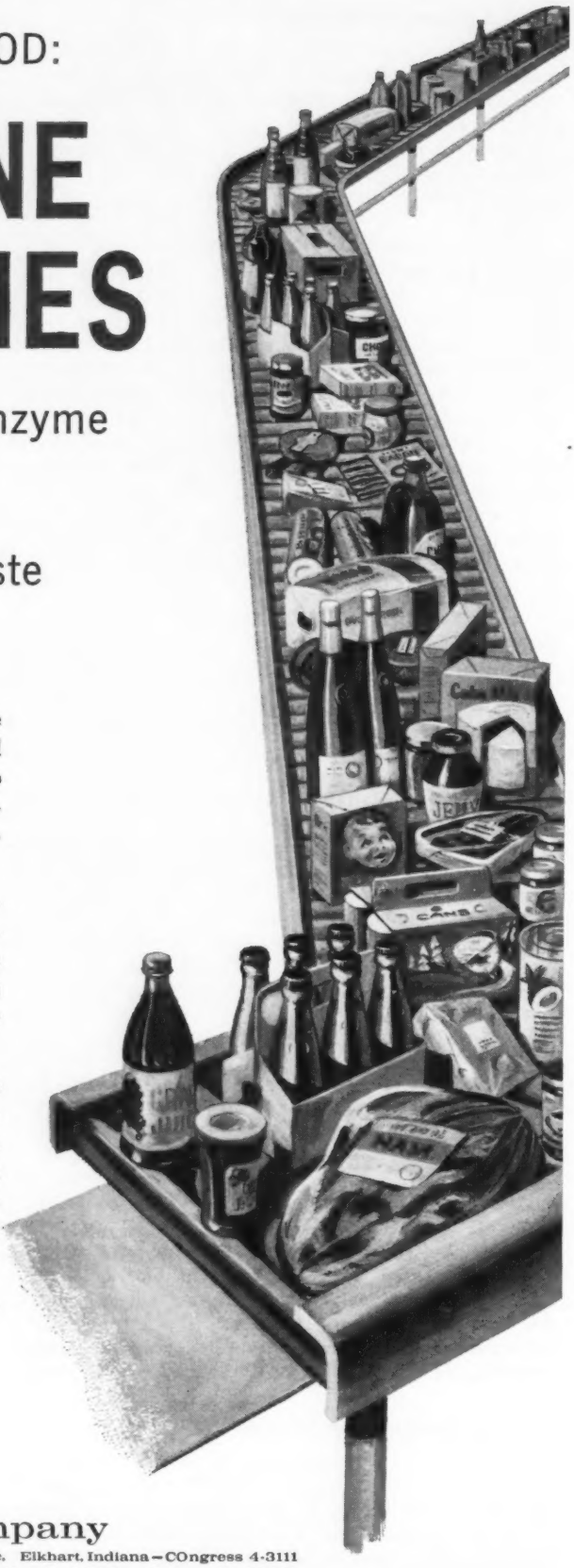
Pressure-sensitive label that adheres better at –30F was brought out by Avery Label Co.

Food bags with superior barrier properties and one less structural ply result from new polyvinylidene chloride latex coating, claims maker National Starch & Chemical.

Miles has a way with FOOD:

TAKAMINE ENZYMES

...industry's biggest enzyme family made to fit your product's good taste



Exactly what does that mean to you?

A great deal. Producing the biggest enzyme family means that Takamine can recommend the precise *enzymatic activity* best suited to your particular job, whether it's starch conversion, proteolysis, removal of pectins, glucose or oxygen removal, or others.

Refined manufacturing techniques have resulted from this broad experience with enzymes. This means we can achieve the exact enzymatic activity required for specific jobs . . . *and maintain its uniformity*, batch after batch after batch.

So if you now use enzymes to enhance flavor, guard color and stability, lengthen shelf life or speed processing . . . or if you suspect you could use enzymes profitably . . . let us recommend a Takamine enzyme for the job. We don't believe you can find enzymes more precisely matched to your needs anywhere.

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Technological Adjustment Pay Makes History

While the public eye was on labor troubles in the automotive industry, management-labor history was made by a food manufacturer.

Armour wrote technological adjustment pay into a new 3-year labor contract with two unions (see page 47). With this the meat packer adopted a chain-wide seniority system to facilitate interplant transfer of displaced workers.

TAP amounts to $65 a week for as long as 39 weeks. It is preceded by 3-month advance notice of work termination, too.

This innovation in labor benefits is a well considered one. Armour set up a management-labor automation committee two years ago and backed it with a $500,000 fund. TAP is the result.

Much better than other solutions

This step by Armour carries deep significance. You see this when you consider the alternatives. One is a shorter work week, "the best way to make unnecessary the widespread technological displacement of employees." We quote United Packinghouse, Food and Allied Workers (AFL-CIO). Another alternative is to give Labor a voice in management.

Both alternatives would be extremely costly to management. Worse, each would defeat its purpose—and to the detriment of business, workers, and the public.

Shortening the work week would cause many workers to take two jobs. So unemployment might be worse instead of better. And with two employers, a worker would not give his best to either.

Giving Labor a voice in management would be a fatal handicap to company progress. Reason? The company would be run for the short-range benefit of workers. Hired management must give impartial attention to labor and to stockholders if it is to please the consumer—the real boss.

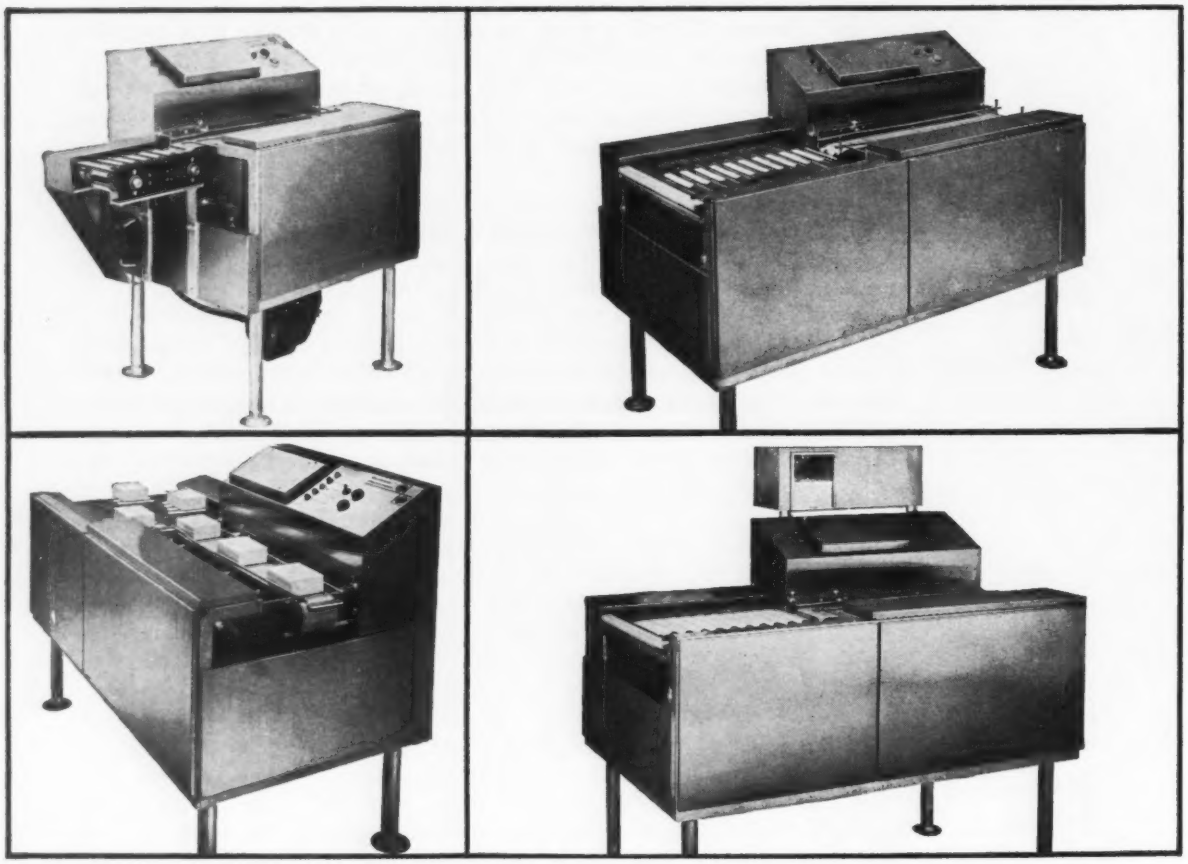
Yet another problem to solve

Food company executives will do well to ponder Armour's TAP innovation. And they ought to do something about another serious labor problem, too. We refer to control of unions by a small clique of employees, whose loyalty is to a labor leader, not their employer. Many of the most intelligent factory workers in America dislike labor union tactics and their results. But they have accepted them as something beyond their control.

It's like civilian politics. Management likes to see employees participate in politics to get industry a fair deal. Management should encourage all workers to be active in union affairs for a similar reason.

"WORK HORSES"

When the line runs, capacity counts! Illumitronic Checkweighers . . . Weight Monitors and Classifiers are rugged, accurate, and consistent performers in demanding environmental conditions. These machines are operating with cartons, bags, cans, pouches, tubes, trays, overwraps, blow-mold plastics, and products unsupported by packages. Speeds to 300 units per minute. Accuracy ±1/30th of 1 oz. Weights to 10 lbs. Investigate the economies of *automatically weighing in motion with featherweight accuracy!*



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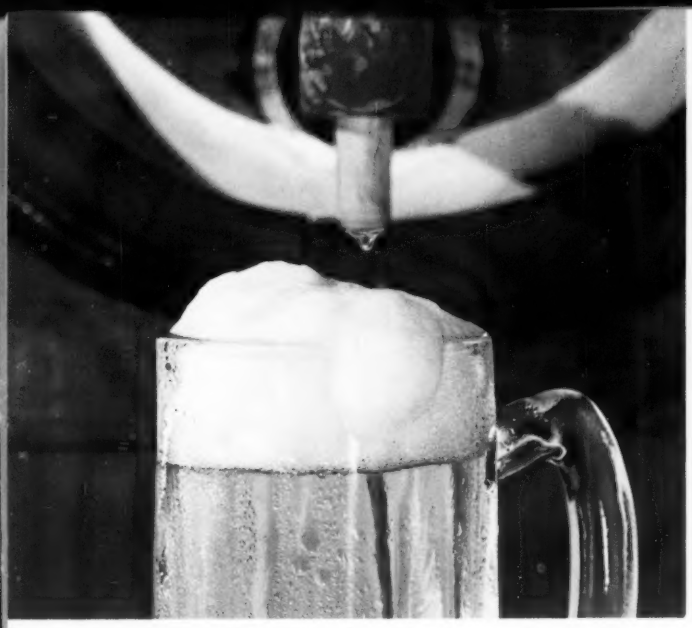

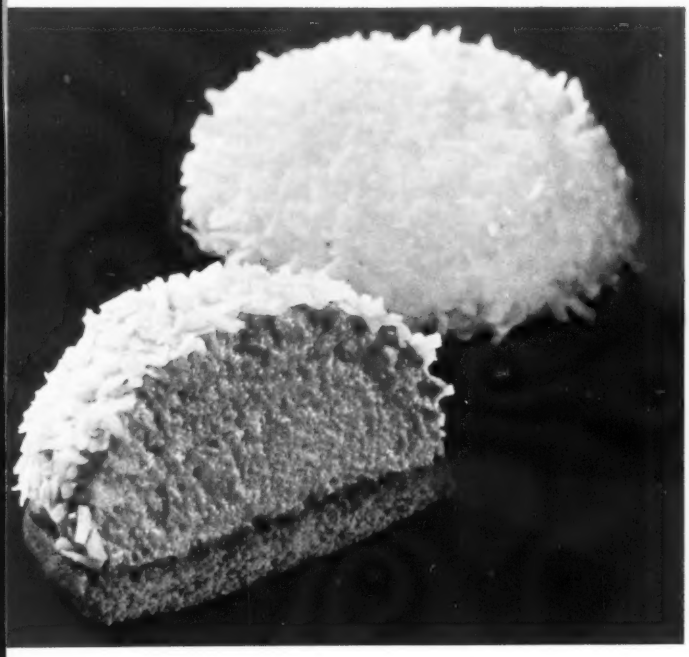

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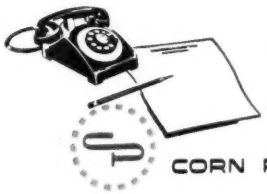

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ONE OF A SERIES OF CHATS ABOUT THE CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

WHY THE BIG STRAIN?

It's tough to keep gases and liquids "clean" as they run through a pipe. They drag impurities along, which can make even plain water a trouble maker, let alone more sophisticated juices. That's because water, as a liquid or steam, is intimately involved with vital equipment like steam traps, temperature regulators, or tools. Meters, burners, nozzles, and pumps, too.

By this time you must realize we're going to talk strainers, don't you? A good, stout subject, of interest to all who feel production belongs up and costs belong down. Sarco makes strainers for water and condensate, steam, oil, air, gas and other piped fluids . . . dozens of different sizes and types and ratings of strainers to match every application need. Even our line of plain and simple strainers is built for super service. These are pipeline strainers, types AT, BT, and CT, which are designed for 250, 250 and 600 psi non shock, respectively, and 475°, 450° and 750°F. temperature ratings. Standard screens are heavy-gauge, perforated brass or stainless steel. Sarco specializes in screens that can withstand abnormal pressure differentials created by accumulated sediment.

Next, Sarco's flanged strainers, type D. These come in larger sizes, right up to 12", and are available in standard or extra heavy types.

And finally, *Sarco scraper strainers*, manual or motorized. These are the really eye-popping models, and if you can't use one yourself — well — you'll just have to get your kicks elsewhere.

Examples? Take Inland Steel Company at East Chicago, which gets water from Lake Michigan to cool its large air conditioner condensers. The water used to pass through traveling screens, but still contained fine sand. Clogging! Heat under collars! Frequent cleaning required! Sometimes practically no air conditioning on hot days. (Isn't that always the way?)

The Inland Steel people installed Sarco Rotary Scraper Strainers, Type VRS, which incorporate a hand-operated helical scraper knife within the cylindrical strainer screen. A few turns of the crank at regular intervals, and the sand is scraped off the screen, blown clear, and discharged at pressure through a manual valve to waste. Dismantle the strainer? Shut down the unit? Not *this* strainer!

Now, as long as we've come this far, it's only a hop and a skip to the Firestone Tire and Rubber Co. in Akron, Ohio, who also use water in tremendous quantities. They circulate it through tire presses and a cooling tower, and there's no nonsense about it. It *has* to be clean or damage to equipment could be downright catastrophic. When the plant

modernized and enlarged, Firestone replaced their 4" Sarco hand-operated scraper strainer, type VRS, with a larger Sarco 8" model. And while they were about it, they got the motor-operated type, for continuous cleaning.

When we say that companies like these want the insurance of a Sarco strainer, it sounds like advertisingese, but sometimes there just isn't any other way to put it. Sarco strainers *are* insurance at low cost on the operation of your high cost equipment. So when we ask if you have lumps in your pumps, or worries over your slurries, we're *serious*. We've heard everything in the straining line, so why not write us for literature and answers to those special problems you have.

A T-44 IS THE BEST POLICY

Sorry, but we can't leave the subject of insurance without bringing to your attention one of the best little insurance policies any company requiring cooling control could invest in. It's the *self-powered* Sarco T-44 Automatic Cooling Control. No compressed air or electricity is needed, but its advantages are best described in terms of three different plants of just one Sarco customer — Revere Copper and Brass, Inc.

Revere-Baltimore, Md., has cut water use 40 to 50% with T-44's. But in addition to former water waste, Revere had even more problems: possible wet air from uncontrolled cooling of compressor aftercoolers, plus sweating compressor cylinders; variations in viscosity of hydraulic oil and bearing oil; gas generator water waste; unreliability of manual shut-off of water supply when machines were down.

If your ears perk up in sympathy at mention of any of these problems, the results of Revere's cooling control program should bring you to full attention. One large compressor that had gulped 2400 gallons per hour now takes only 420 gallon sips. In addition all the problems itemized above were solved. T-44's are now used on their air compressors, gas generators, and hydraulic oil systems. At Revere-Riverside, Cal., water savings of 50% were experienced, and at Revere-Rome, N.Y., substantial savings were made too.

But after all, wasting water is only one way of wasting money, so let's go on to another matter of interest: the evils of manual control. When cooling water is controlled by hand the temptation to leave the valve nearly wide open is almost overpowering, in order to play it safe if the load varies. Result: overcooling, of course. And varying the flow runs the risk of undercooling. In either case, lowered process efficiency. Answer: The automatic Sarco T-44, which can't be tempted, is meticulously honest, unsentimental, and plain inhumanly practical when it comes to cooling control. You really ought to write for literature. T-44 is your best policy.

SPARE PARTS INSURANCE

As long as we're near the end, and still on this subject of insurance, may we graciously leave you with this valuable tip? No matter how closely a steam trap approaches perfection, some gremlin may cause it to act up. It's conceivable. So, keep on hand a parts list and spares of key parts for your steam traps and other system components. Parts are small and worth their weight in gold when you need them. A Sarco field engineer will make up a suggested list for you, if you tell us what components make up your system.

Might as well even keep a disc or two on hand for your Sarco Thermo-Dynamic Steam Traps, Type TD-50, even though they're so trouble-free our salesmen keep complaining about the lack of replacement parts business. We'll be glad to tell you about this unique steam trap in case you still don't know how miraculously simple and effective it is.

Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both — to the point where you'll communicate.

7819

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STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

SARCO

CIRCLE 147 ON INQUIRY CARD FOR STRAINERS; 148 ON T-44; 36 ON TD-50

SEN. HART tells FE editor: "I hope the food industry will review its packages, asking itself: Is this a fair shake for the buyer?"

Food Packages Under Fire

Triple-threat drive by Congressional probers, FDA, local sleuths forces review of fill-and-weigh procedures. FE survey shows how industry tackles problem

EXTRA VIGILANCE on the packaging line has become a new essential in food makers' manufacturing operations. A sweeping Congressional probe of industry labeling, a stepped-up FDA crackdown against short weights and slack fills, and a coordinated Federal-state drive aimed at "economic cheats"—all are forcing processors to take a second look at their much-touted "silent salesman."

A spot check by FOOD Engineering last month found 1 out of 3 food firms reviewing their fill-and-weigh procedures. Half of the respondents said a new breed of check-weighers may be needed to cope with the problem of hard-to-fill items.

Behind the food makers' concern is the fear that packaging is in for the same kind of hard look the government has fixed on industry's pricing, selling, and promotion methods. As against this, investigators feel that packaging, being a fast-growing but relatively unexplored area, merits an examination to see if new laws are needed to cover certain trends.

Such a probe is now being carried out by a Senate Antitrust Subcommittee, headed by Sen. Philip A. Hart. The committee kicked off its inquiry with a widely-publicized 3-day hearing, plans at least three more open sessions. In turn, the solons will query retailers and wholesalers, then processors and trade groups, and wind up with government agencies: USDA, FTC, FDA, Bureau of Commercial Fisheries, Commerce Dept.

Vox Populi: A Sour Note

Even more significant than the barrage of criticism laid down at the opening hearing is the flood of mail the committee has received from consumers (see page 40 for analysis). Eager-to-help writers have sent in box tops, wrappers, and can labels as Exhibit As of alleged deceptive packages. This outpouring gives the committee a rich lore of leads to follow as well as **a documented record with which to confront food processors when it's their turn to testify.**

While the Hart committee explored the question of new laws, FDA showed that existing laws still have some punch. From June 15 to August 30, FDA seized 106 food lots on short weight charges, including 16 for mislabeling. These grew out of a nation-wide check of 4,436 samples.

THAYER C. TAYLOR, Associate Editor, "Food Engineering"

During the whole of 1960, according to an FE analysis of FDA's monthly "compliance report," the agency made only 38 such seizures.

Commissioner Larrick hinted at a shift from the carrot to a big stick policy when he observed: "Through educational efforts and a limited number of regulatory actions, we have tried to keep industry aware of its responsibilities. However, from several sources we have reports of continued abuses, and these are borne out by the survey."

Washington sources feel that FDA may be building a case for its appearance before the Hart committee. Others opine that recent budget hikes have given FDA the manpower it lacked before to curb deceptive packages. A third view is that, like any other regulatory agency, FDA's enforcement arm is guided in part by what's said in Congress.

With Washington drawing a bead on food packages, it's a matter of time before local authorities take their cue in their own baliwicks. Larrick gave them a green light recently when, in talks to the Assn. of Food & Drug Officials of the U. S. and the National Conference of Weights & Measures, he urged that "all of us who enforce laws that require full weight or volume in foods get together in a concerted drive to make short weight practices unprofitable."

What To Do

All the furor over alleged deception leaves food makers nonplussed. Considering the $7-billion-plus they spend each year on protective, convenient packages, they are mystified by the outcry.

However, noting the critical trend, they are carefully reviewing their check-weighing areas to plug up possible loopholes. Thus, a leading packaged foods producer told FE he has "tightened checking procedures to impress operating personnel with their importance in the program."

The purchasing director of a prominent freezer cites his firm's 3-step program: "1) Constant checks by packaging foremen as to the setting of automatic filler. 2) Actual weighing of 2% of all filled packages with results reported to the foremen. 3) Constant weighing of 1/10 of 1% of all packages after freezing."

A meat packer's package chief reports the installation of more automatic checkweighers. A packaging research manager of a prominent baked goods concern notes that his firm has "launched a broad project for examining all our filling lines."

Statistical techniques are being relied on by a large dairy outfit, too, but qualifications here are pointed out. Says the outfit's quality control director: "Our procedure determines product net weights and, by statistical analysis, calculates control limits on each filling operation. This procedure is readily applied to products wherever net weights can be taken before the product is placed in the package. In liquid products, particularly those which are sterilized, it is hard to set up a statistical net weight control procedure. Container itself may have such a wide variation that net weight determinations require actual weight

Q. Why was the subcommittee's first hearing dominated by critics of present packaging practices?

A. It's normal procedure to identify what the problem is. Our preliminary investigation raised the question: Is there a problem? So we invited experts who said a problem does exist. And it seems they made out a pretty strong case.

Q. Does the testimony presented, as well as the letters you have received, suggest that the manufacturer's freedom to change his price and package should be curbed?

A. While I do not want to rule out the possibility that changes will be recommended, it is too early to discuss new laws. Certainly, no curbs on the freedom you mention are planned. But, if the manufacturer does change his package, he should make sure the consumer knows it isn't the same animal it was yesterday. If the package contents are reduced from 6 oz. to 5 oz., say, and the new box appears to be larger in size, then something isn't right.

Q. Do you plan to confine future hearings to packages per se? For example, it has been suggested that point-of-purchase signs, set up near the product, should be considered part of the product's labeling.

A. We have no plans to expand in that direction at present. Our primary area is what is said on the package itself; that's enough to keep us busy. If it should develop that the related signs which induce consumers to buy are a form of deceptive advertising, then maybe we would get into that.

Q. You are a co-sponsor of a bill to establish a Cabinet-level Dept. of Consumers. What could such a department do in the area of deceptive packages?

A. Many of the people writing to us said that such packages were a long-standing complaint of theirs, but they didn't know whom to

write to. A Consumers Dept. could have focused attention on this problem long ago by acting as a clearing house. It would also be the logical place to effect the kind of education consumers need to fight deceptive packaging, just as USDA, for example, gives buying tips on lamb. FDA gives some advice on packaging, but with their limited funds and personnel they have had to concentrate on the primary job of insuring safe and pure foods.

Q. You often stress the point of the consumer's "rational choice" between competing products. What do you mean by that?

A. If you buy something, and know how much you're getting, that's rational choice. But with 6,000 items in super markets this has become more difficult. When a consumer is confronted with 10 cereal brands on the store shelf, she should be able to figure out the per ounce cost of each. Then, based on this, and considering the quality of each brand, she would decide which brand was best for her budget. But this has been made difficult by hard-to-find contents identification and the odd sizes with fractional ounces that require a mathematical genius to figure out. It raises the question of whether it is desirable to have contents stated in a certain size type in relation to the package area, or whether some kind of size standards are necessary.

Q. Would you have any message for the food industry on this problem of deceptive packaging?

A. This is a new field of study. Sometimes these problems creep up on us because we are so busy with other matters we don't notice them. I hope the industry will review its packages, asking itself: Is this a fair shake for the buyer? Purpose of our laws is to keep the buyer informed. Under today's sales conditions, the manufacturers who make the contents hard to find, by blending colors or putting the necessary information in the folds of the package, is selling as close to the edge of the law as possible.

of the package to accurately determine the contents weight. Due to package variation, it is generally recognized that to comply with minimum fill, it is necessary to slightly over-fill."

'Tain't Simple, McGee

Packaging officials, pointing to the complexities of the problem, cited products with **"almost a need for 'deceptive' packaging."**

Reasoned the president of one baked goods firm: "Iced and glazed products require room over the product to prevent damage. Strictly from the point of view of percentage of space occupied by the product, a great many bakery packages might be regarded as 'deceptive.' **The choice really is to have non-deceptive and unsatisfactory, or deceptive and protected, packages.** This applies to boxed products with coatings or with poor dimensional stability under mechanical stress."

About half of the companies checked expressed the need for improved check-weighing equipment. A brewer pointed to the problem of checkweighing at close to 1,000/cpm speeds.

More work has to be done in area of volumetric powder filling a convenience foods maker contends. "Filling powders by weight is relatively slow compared to volumetric fillers," he notes. "In order to maintain accurate weights, we have to check-weigh each filled package."

Cake mixes were cited as typical of products not lending themselves to volumetric or auger type fillers. "In these applications," one view ran, "use of weighing equipment and its adaptability to packaging machinery in use has to be examined." Another firm felt that there is a need for better equipment "in the filling area wherein products containing different size pieces of ingredients are involved."

Depending upon the product, density was frequently cited as a formidable problem. Typical was the view of this dehydrated products manufacturer:

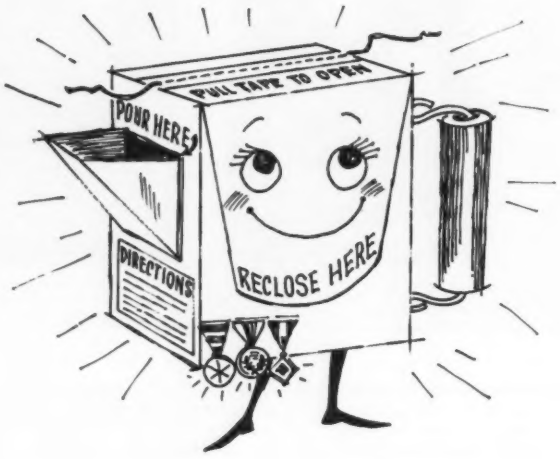
"Most of our raw materials are natural products, hence it is not possible to control their density with any degree of accuracy. Our policy is to control density as closely as possible by selecting specific lots of raw materials. When we can't obtain raw materials of the proper density, then we intentionally exceed the label weight in order to give the consumer a reasonably full package.

"Where recipe usage is required, that is, when the contents are mixed with measured amounts of other materials by the user, it is not possible to overfill, because this would require constant changes of package directions. In such cases, we must fill to the proper net weight even if density variations cause the package to be under-filled.

"A case in point would be several of the potato products such as scalloped or au gratin varieties. Cubic capacity necessary to hold the weight specified by the recipe will vary with the size and shape of the dried slices. Because it's not always possible to obtain the same type of ingredients, the percentage fill of the package is subject to variation even though a uniform weight is maintained."

(Turn page)

FOOD PACKAGE:
Light-Fingered . . . or . . . Helping Hand?



Senate Antitrust Subcommittee that is looking into food labeling practices has been helped by an army of in-the-field sleuths. An estimated 700-800 letters have been sent in by irate consumers—many with samples of irksome packaging.

FE's editors checked 200 of these letters. Briefly, chief irritants are packages with fractional ounces, hard-to-find label information, cents-off changes that don't list old price for comparison, containers that have been reduced in size but still carry the former price tag (resulting in hidden price increases), and oversize boxes with more than the average air space.

Consumers' Peeves

Of course, many of the gripes can be traced more to the retailer than to the manufacturer. Such as the angry contention of this Los Angeles housewife: "Shopper must carry a slide rule and be accompanied by a CPA to verify her calculations. Regular price of 21 oz. can of pork 'n beans is 2/39¢. Special was 5/$1. On the regular price you get 42 oz. for 39¢, while on the special you pay 40¢ for the same amount. This is nice selling, as the market moves 5 cans in one transaction and charges you extra for the privilege."

Typical of the many complaints against odd sizes was this by a Bostonian: "I'm 100% in favor of legislation eliminating fractional ounces. It's a terrible thing to stand there, with people trying to get by and the baby climbing out of the shopping cart, to search through all that twaddle about sun-enriched goodness and free teaspoons, just to ascertain that there are 11¾ oz. in the 27¢ package, where the 33¢ carton contains 1 lb. 3¼ oz.—and then try to do the arithmetic involved."

Reductions in net contents without compensating price changes drew considerable fire. A Baltimore housewife told of the following letter she sent to a prominent maker of dehydrated potato products: "I purchased two boxes of your mashed potatoes that were superficially identical in appearance. Both are marked 'new,' both say 8 servings. One box says '7¢ off.' Why didn't it also say that contents weight is ⅝ oz. off? This package, the box states, contains 6½ oz., but the one at the supposedly regular price state 7⅛ oz. How new is new? Which new is newer? And what is now new, by your definition?"

Many letters urged adoption of the metric system for contents declaration, that lettering used for net contents be required to appear on a designated part of the box and in letters that are a fixed ratio to the largest size type appearing on the face of the package.

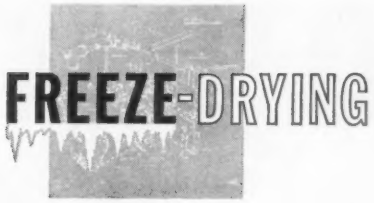
While housewives dominated, a fair sprinkling of influential parties chimed in. The president of one of the leading department stores in the country urged "a law requiring caloric contents to be stated on the package." A college president asked for "compulsory grade labeling," while a package machinery salesman hoped that "some tough laws are passed, for we in packaging know that honest packages are plentiful and not prohibitive in cost."

Not the End of It

There were indications, too, that the critical testimony would still be around to haunt packagers long after the subcommittee closed up shop. A Massachusetts Institute of Technology professor, who lectures widely before women's groups, asked for a copy of the hearing transcript "for material for future talks." A home economics teacher also sought a copy for her classes. And a buying group that handles procurement, quality control, and label programs for two Midwest food chains requested a copy "for future guidance."

Of course, not everyone approved of the investigation. Tartly observed one critic: "Why should government wipe the citizens' nose for him? It doesn't require a slide rule to know that 8 oz. means a half a pound, or that the word 'jumbo' in front of a 'half quart' doesn't make it a full quart. If complainers wrote blistering letters to presidents of cereal companies, they'd get action." (End)

Here are facts and figures that show how economical freeze-drying is becoming. Before costs "frighten" you out of a new source of profits . . .



Take a New Look at Freeze-Drying

HOW WILL YOU DO competitively in the field of freeze-drying? You'll do much better if you know something about the economics of freeze-drying operations.

Cost-cutting is one way to keep ahead in this game. Vacudyne Corp., Chicago, has come up with some ingenious innovations which can pay off quickly and handsomely. The figures and facts presented here show how and why freeze-drying can be economical.

Basic operating economics boils down to this: **How to get a pound of water out of a product most economically and under conditions controlled by your plant requirements—regardless of temperature and pressure ranges.**

Excellent economically feasible freeze-drying equipment can be built to suit individual plant requirements. What equipment manufacturers need is information on: (1) products, (2) moisture content to which product's to be freeze-dried, (3) plant layout suitability to cylindrical or rectangular chambers, (4) amount of available steam, (5) refrigeration capacity, (6) water supply, and (7) associated operations that could use waste steam.

Supplying equipment manufacturers with such data will assure you the most for your capital investment and operating dollar.

How long you freeze-dry your product has a direct bearing on your operating cost. You must know how dry you want your freeze-dried product to be. If you want a product with a 6-months' shelf-stability, then you'd better dry it to at least 2% moisture —less, if your equipment is capable. If your product is to be consumed almost immediately after processing, then you don't have to dry it as much.

Efforts to reduce drying time in a given situation don't necessarily involve additional equipment costs. Recent studies, for example, have shown the advantage of an arrangement fostering radiation over conduction heating, without need for additional equipment. Here, product is supported between, rather than on, platens that permit higher platen temperatures. Reason is that product doesn't contact shelf and reach shelf temperature.

At present, the most economical way to reduce the drying cycle is to add a number of additional cabinets to the vacuum-removal system. Cabinets are inexpensive, require essentially no maintenance. What's more, they reduce operating costs by maintaining a constant load upon the vapor-removal system.

Optimum, of course, is a continuous system of freeze drying. Yet, none has been built to handle all products. But an adequate, commercially feasible continuous system will be built whenever production requirements demand one.

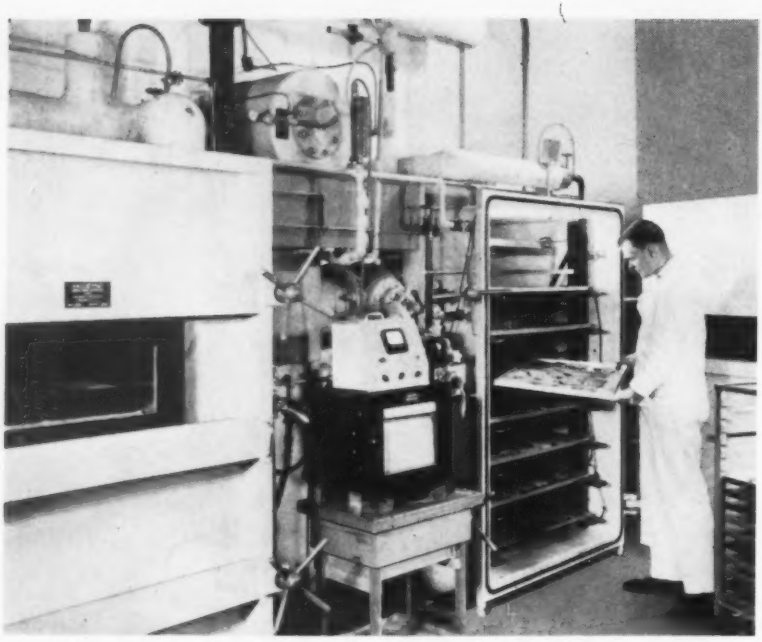
Tailoring Low-Cost Equipment

Vacudyne designs and builds equipment to suit user's requirements—a concept that company feels is important for freeze-drying products efficiently and economically.

Examples of this design philosophy:

► **One is a system for the Food & Container Institute.** It was designed around two drying cabinets, each 4x4x5¾ ft. (inside dimensions) and containing eight platens for a 300-lb. load capacity. It's a

A. N. LEDERMAN and F. H. LINDSTROM
President and Vice president, respectively, Vacudyne Corp., Chicago



SIDE-BY-SIDE freeze-drying units are loaded with trays of beef patties suspended between heated platens. With doors closed, air is evacuated as automatic temperature controls take over the drying cycle.

pilot-plant system capable of modest commercial operation while, at the same time, retaining research versatility. It's equipped with a 4-stage steam ejector system for evacuation, with an added smaller ejector to reduce pulldown time. It operates at 750 microns, with a dead end of 500. It can be operated continuously at intermediate higher pressures—in accordance with research requirements. At the 750-micron level, system's moisture removal capacity amounts to 50 lb. of water and 5 lb. of air/hr.

Vapor condensing is easily accomplished in barometric condensers, employing cooling tower recirculating water. Cabinet's plate temperatures range from —20F. (to freeze products in-place) to 300F., without shutting down equipment.

Initial cost of system — completely instrumented for automatic operation and installed with boiler plant—was only $50,000. In addition to system's cost advantage is its freedom from maintenance. No electronics is involved, nor are there vacuum pumps or hydraulic systems — almost no moving parts.

Operating costs are also low. System operates continuously without downtime for defrosting condensers or repairing. Automatic controls designed into system eliminate operating personnel, once cycle is started.

With this system, cost of removing 1 lb. of water is 3⅓¢ for capital investment and 2¢ for operating—a total cost of 5⅓¢. Calculations assume using 1,000 lb. of steam ($1.00), operating system for 250 days (for the year) and including 10-yr. amortization.

This small system, designed for research, is not optimized for economy. Moreover, its evacuation system is oversized, can handle two additional cabinets for further operating economies. A larger system can be constructed with greater steam efficiency. And cost of removing 1 lb. of water from product would run about 2½¢.

Further economies can be incorporated into such a system. For example, an absorption-refrigeration system (using back pressure from properly designed jets) can be employed to freeze a product.

► **Another Vacudyne installation involves some interesting design features.** Unit's 35-cu. ft. drying cabinet (product capacity of 200-300 lb.) is evacuated by two rotary vacuum pumps protected from vapor load by a refrigerated vapor trap (35 lb. of water/hr.). To guarantee proper load-handling capacity and to prevent operating pressure from rising above its design point, a cold trap larger than the main chamber was designed.

Several features designed into condenser greatly enhanced its capacity, saved space. One is a hot-oil system providing platens with an ambient-to-260F. temperature range. Since products were to be frozen outside dehydrator, platens didn't require refrigeration.

Approximate cost of installed system was only $40,000. Operating costs, however, are slightly higher than those previously mentioned because: (1) capacity is smaller, and (2) downtime is longer (for defrosting condensers).

Further economies may be realized by installing a mechanical pumping system (for handling non-condensables), coupled with a chemical absorption system (for handling water vapor).

► **Still another unique installation** involves all the engineering for a dehydration plant containing a number of dehydrators—and all the necessary mechanical equipment. All dehydrators employ steam jets as their source of vapor removal.

Design Cost-Chopping Steps

In general, the design features in Vacudyne's tailored freeze-drying equipment involve the use of:

. . . **A special vapor trunk** built into drying cabinet for efficient removal of large amounts of vapor. This vapor no longer travels the entire length and width of each shelf during the course of its removal from the system. Old techniques involved pulling vapor through a single header at rear or side of drying cabinet. This meant a long distance travel of vapor from front to rear of cabinet before reaching header for discharge to condenser and vacuum system.

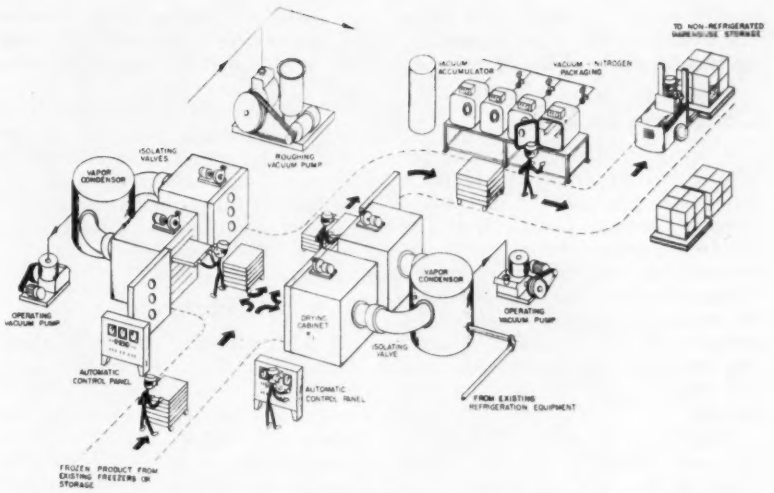
. . . **Mechanical handling equipment** to load and unload a large capacity drying chamber within 5 min. Efficient material handling arrangement is sometimes designed so that product properly loaded into equipment need not be rehandled until completion of freeze-drying. Techniques require little additional capital investment, yet almost no maintenance and specialized operating knowledge.

. . . **Large, rectangular multi-pane windows** (in place of small circular ports) provided for chambers to furnish visibility. Even small lab unit's entire door is glass-window fabricated. Large production-size units feature amply sized rectangular window sec-

tions so operators can view products, and sufficient glass area provides adequate lighting of interior.

. . . **Fluid heat-transfer medium** (Vacunate 20) to span the –60 to 300F temperature range necessary for acclerating freeze-drying cycling time. Raising temperature of radiating sources to approximately 300F. considerably shortens drying time. But it's still necessary to reduce platen temperatures to around –40F. at start of cycle. Problem of achieving extremely low and subsequently high temperatures was solved with the new single-fluid medium, which is highly stable, pumpable, and of relatively high specific heat.

. . . **Round - cornered chamber configuration** to eliminate internal projections, corners and crevices so as to abolish accummulation of dirt, dust and microorganisms. Chamber's corners are rounded to a substantial radius. There's adequate clearance between platens, supports and headers for visual inspection and easy cleaning of chamber's interior. All units are sandblasted, finished with several layers of long-lasting epoxy coating (food grade). Under certain conditions, condenser and drying chamber are hot-dip galvanized prior to applying finished paints.



TYPICAL COMPACT freeze - drying installation shows simplicity of operations required. Featured are four dehydrating cabinets, complete with platens and their respective heating system, vapor condenser and vacuum pump. Single vapor condenser serves two drying cabinets, with complete system serviced by large-capacity roughing pump and smaller capacity operating vacuum pump for each pair of cabinets.

Low Cost Evacuation

Economics, more than nature of product, dictate choice of evacuation systems. Where sufficient refrigeration is available or plant personnel are familiar with refrigeration maintenance, equipment's design usually centers about mechanical pumps and refrigerated cold traps. Where there's ample steam or an excellent source of cooling water, choice is toward a steam ejector-evacuation system. Low fuel, as contrasted to occasional high electrical costs, also dictate ejector-type system. With steam jet ejectors, a 4-stage system is normally employed. Inter-condensers are incorporated between 2nd- and 3rd-stage and between 3rd- and 4th-stage ejectors.

Equipment of low-level design can be installed within a 10-ft. headroom to conserve space while eliminating a 35-ft. tail pipe and notwell (customarily associated with steam ejectors).

Ejector systems normally operate at pressures as low as 400 microns. But a unique control system operates steam ejectors anywhere between 400 microns and 2-3 mm. As a result, system can perform continuously without shutting down equipment to defrost condensers. Vapor is removed through ejector vents, condensed in direct-contact, barometric-type condensers. Where certain esters and flavors are to be salvaged from affluent, surface-type condensers instead of direct-contact barometric ones are designed into units.

Operating costs are substantially reduced through use of a roughing and operating pump system. Large-scale, multiple-cabinet type production systems can be rapidly pulled down with ejectors arranged to service all cabinets. Standby hogging systems are provided as a roughing vacuum source.

When mechanical vacuum pumps are used with large production units, it's more efficient to design such systems about a large roughing vacuum pump (for rapid pull-down of alternate chambers) and low-horsepower operating pumps (for continued maintenance of negative pressure). Properly designed condensers and cold traps handle all vapor evolved during freeze-drying. So a vacuum pump need only handle extremely small amounts of non-condensables within a product.

Instrumentation varies, depending upon amount of sophistication and automation desired. Basic essential instruments are employed to control temperature of platens and to indicate and/or record absolute chamber and condenser pressures.

Automatic Process Control

For automatic sequencing, temperature of heating platens are program-controlled. Separate, interchangeable cam-type programs are set up for a wide variety of products. Control system's overriding safety devices avoid possibility of ruining a product batch.

Specially designed systems with a double set of controls now maintain temperature and absolute pressure at predetermined levels. Absolute pressure is the controlling factor at start of cycle, when large volumes of vapors are removed. Pressure is held constant at the highest safe level for most of the drying time. As product dries and smaller amounts of vapors are withdrawn, system automatically switches over to temperature control.

Products vary greatly in their sensitivity to heat and ability to undergo drying. That's why it's necessary to design equipment that is flexible in operating at wide temperature and vacuum ranges.

Normal operating range most successful for a majority of products is at pressures between 500 microns and 1 mm. Freeze-drying cycle is carried out rapidly when platens are maintained at tem-

peratures up to 300F. and trays are loaded at 1½ (for vegetables, up to 4 for shrimp) lb./sq. ft.

Costs Less To Ship

A dramatic, shipping example is the shrimp industry. Here, a gulf-state producer is now shipping to Chicago, for $1.65, 100 lb. of freeze-dried shrimp that reconstitutes into 500 lb. of ready-to-eat shrimp. To ship 500 lb. of frozen shrimp the same distance costs $24.20. Cost of storing freeze-dry shrimp is also lower—50¢ less/100 lb. for the first month.

Despite additional costs of process—on which estimates range from 2¢/lb. and up—this "instant" shrimp can be **marked for 14¢ less/lb.** at a good profit.

Freeze-drying may help simplify the art of cooking. With '61 sales of freeze-drying equipment estimated at $6 million, the technique is now at the institutional level—just a step away from the housewife who is eager for quick things.

Problems To Be Faced

There are some drawbacks to the freeze-dehydration process. Complex equipment is required, and an extensive consumer education program will be necessary to remove the stigma dehydrated foods suffered during the war.

What's more, technological difficulties must be solved before it's economical to process foods more than ½ in. thick. It takes extra time to freeze-dry extra thick sections.

There's no doubt that a freeze-drying industry is coming into existence. The process is here to stay. It remains now but to separate the theoretical academic literature and discussions, which confront the food processor, from the practical. Also, it's necessary to establish the down-to-earth aspects of how, where, and when freeze-drying can be used at its economical best.

But the truth of the matter is that freeze-drying is not any more expensive than other methods of food preservation. In many instances it's more economical than freezing when considering final distribution or retailing.

For those in the frozen food industry already familiar with the prerequisites of freeze-drying, steps required to enter this new field are simple and straightforward. Rather than a replacement process for freezing foods, freeze-drying is a logical adjunct offering the possibility of expanding into new markets.

Freeze-drying is a comparatively slow process. Contrary to the tremendous efforts and volume of written material prepared to stress need for accelerating this process, we must live with time cycles now available.

Slow but Economical

Cycles currently being achieved range from 6 hr. (for vegetables) to 16 hr. (for meats). Furthermore, by the very nature of the process, freeze drying is, at best, a batch-type operation. **Nevertheless, large quantities of products can be processed without tremendous outlay of capital investment or plant expansion.**

For instance: A typical 4-cabinet installation has a rated capacity of 750 to 1,000 lb. of wet products/cabinet/cycle. Total capacity for the installation amounts to 3,000-4,000 lb./cycle.

Most equipment can be designed for fully automatic operation. Yet, it can be run 24 hr/day to average out to two cycles. This provides an overall capacity of approximately 7,500 lb. of wet product/day.

Since packaging takes much less time than freeze-drying, it can easily be scheduled to coincide with other plant operations. In this manner, a minimum amount of labor is required at any one time.

What's Involved

A typical freeze-drying installation (see drawing) shows the simplicity as well as quantity and type of operation that would be required. Shown are four dehydrating cabinets, complete with platens and their respective heating systems, vapor condenser and vacuum pumps.

With this installation, a single vapor condenser serves two drying cabinets. Entire system is then served by a large-capacity roughing vacuum pump, with an operating vacuum pump of much smaller capacity and horsepower for each pair of drying cabinets. Also, this compact system can be conveniently installed in a 1,800-sq. ft. area.

Noteworthy is the abundance of refrigeration in a plant set up to freeze foods. Therefore, the typical freeze-drying installation requires no additional compressors—refrigeration is taken from existing equipment.

To complement freeze-drying equipment, economical, simply-operated, fully-automated vacuum packing machines have been developed by Vacudyne. These are available for both cans and flexible, laminated packages.

Contrary to cost figures prevalent in the early stages of freeze-drying development, a typical system (as illustrated and omitting packaging) can be completely furnished and installed for approximately $110,000. Modules to increase or decrease capacity can be proportionately added or subtracted. Such an installation has an annual capacity in excess of 1¾ million lb. of wet product. Moreover, no special foundations or unusual installation problems would be encountered with the equipment. And utility requirements are nominal.

This information is correlated from a plant possibly located in the Midwest. Here, quantity foods would be freeze-dried, stored 2 to 3 days prior to shipment to Texas for ultimate distribution through wholesalers.

Cost To Process and Ship

Based upon a 5-yr. amortization period along with utility and labor costs (typical for a Midwest processor), cost/lb. of product processed (including packaging) would run 6.3¢. This is approximately 3.7¢/lb. more than the cost of freezing an equivalent quantity of product.

But let's carry this example further. After preparation, a product must either go into storage or be shipped to an ultimate consumer before processor's costs terminate. A freeze-dried product can be stored in an **unrefrigerated** warehouse prior to shipment, while a frozen one must go into sub-zero storage.

If a freeze-dried product is held three days in a non-refrigerated warehouse and then shipped from the midwest to Texas, a 6,000-lb. lot would cost approximately $44. Shipment is made in an unrefrigerated truck, and minor delays, breakdowns, etc. wouldn't affect quality or ruin product.

In contrast, the frozen product must be rapidly removed from refrigerated storage and loaded into refrigerated trucks for quick dispatching to the Texas destination. Cost of this shipment would run approximately $300 for the 6,000-lb. lot. Should the truck

break down en route or its refrigeration equipment fail, the processor might lose his entire shipment.

A breakdown shows that it would cost $256 more to ship and approximately $12 more to store (prior to shipment) the frozen than the freeze-dried lot. This amounts to a total additional cost of $268 over the freeze-dried lot.

A further breakdown: Cost of processing 6,000 lb. of frozen product and shipping comes to 7.8¢/lb. On a similar basis, a freeze-dried product would average out to 7¢/lb. (reconstituted).

In reality, the true cost of freeze-dehydration is equal to or actually less than conventional methods—as illustrated by this example. As each day of storage or mile of transportation is added to freeze-dried or frozen products, cost begins to equate. Eventually a point is reached where freeze-drieds become more economical.

Economics of Convenience

With today's emphasis on convenience foods, fast cooking, greater profits and more efficient operations, it's difficult to measure, in dollars and cents, the convenience aspect of freeze-drying. Hotels, institutions, restaurants, campers and the military are extremely concerned with transportation, storage and preparation costs (**after** they have purchased a product). But it's convenient for the chef or consumer to rehydrate pre-cooked, pre-cleaned food products—then chill or heat and serve.

Freeze-drying has proved successful for almost all types of foods. Ranging from fresh fruits and vegetables (peaches, strawberries, mushrooms and green peas), through fish and seafoods (shrimp, crab, lobster, and fish fillets), through poultry and meats (chicken, turkey, steaks and chops), the process beats freezing in certain respects. Freeze-dried products are dry, can be stored at normal room temperature in simple cans or non-breathing plastic containers. And the retention of flavor, food value and texture of rehydrated food is excellent.

It's now possible in a matter of minutes to enjoy a complete 7-course dinner, ranging from fruit cocktail as an appetizer, through dehydrated soups, to several entrees of seafood, poultry or meat and innumerable side dishes of vegetables, all prepared from a dehydrated product. (End)

CHOCOLATE ENROBER maintains uniform coating thickness with new integral temper-control system.

Coater maintains full chocolate temper, thus . . .

Ups Enrobing Efficiency

CONTINUOUS CONTROL of chocolate temper by a coater incorporating a double-stream recirculating system now enables 'full temper' operation. This, in turn, eliminates the need for continually adjusting the enrober, making temper, or thinning a sludgy tank.

In contrast, most enrobers used today are operated in a 'soft temper' cycle to prevent crystal build-up. Control is possible, but difficult, and the chocolate usually varies between being too warm or too full of crystals.

To retain a good finish, chocolate must contain nuclei of the correct stable crystal form.

Crystal growth would be no particular problem if coaters used chocolate rapidly. However, the average coating-machine tank and recirculating system holds up to 500 lb. of chocolate, which is circulated at rates up to 6,000 lb./hr. Chocolate actually used by the coater ranges 250 - 500 lb./hr. Furthermore, continuous replenishment and intermixing of chocolate with new tempered chocolate does not retard crystal growth in the original mass.

The new tempering technique, on the other hand, involves controlled mixing of two chocolate streams—one tempered, the other untempered. Full temper is achieved and maintained because the untempered chocolate retards crystal growth in the tempered material and, in turn, is properly grained by the tempered stream.

This is the operating principle of the Baker/Sollich Coater, which is distributed by Jabez Burns & Sons, Inc., New York City. Installations have been made at Deran Confectionery Co., Cambridge, Mass., and at W. F. Schrafft & Sons, Boston.

At startup, the machine is filled with untempered chocolate, which is automatically tempered by slow temperature reduction. When tempered, about 6,000 lb./hr. of chocolate reach the wire band.

If, for example, 500 lb./hr. are used for enrobing, the remaining 5,500 lb. return through the wire band to a pump that supplies the heated main tank at 3,000 lb./hr. Here, 2,500 lb./hr. of chocolate are heated to destroy crystals. Make-up chocolate at 500 lb./hr. is fed to the tank. If no chocolate is taken away, 3,000 lb./hr. will spill over into the tank and be heated to destroy crystals.

Chocolate thus processed will remain in the same tempered state whether it is being used or not, provided that not more than half the chocolate circulated is used. (End)

Hot bread cools off on Koroseal

FRESH-FROM-THE-OVEN BREAD, still hot from baking at 450 degrees, cools off as it travels by conveyor to wrapping tables. The conveyor belts previously used were made of canvas. But oily film clinging to the warm loaves stained and darkened canvas, made it almost impossible to clean, finally wore it out.

Then B.F.Goodrich introduced a new, improved belt for food handling —a belt made of Koroseal flexible material. Koroseal defies the things that ruin other conveyor belts—oil, grease, animal fats, most acids. It resists cracking and peeling, never gets soft and sticky. Koroseal doesn't absorb odors from food, has no odor or taste itself to transfer to food.

The bakery owner liked what he heard about Koroseal, decided to give it a try. That was April, 1954. Today, the same belt is still going strong, has already outlasted the life of two canvas belts.

Food particles and oil can't grind or soak into Koroseal's smooth, polished surface. That's why it can be thoroughly cleaned in just a fraction of the time it took to scour the old belts. Even scuff marks from banging pans wipe right off with a damp cloth.

B.F.Goodrich was the first company in the rubber industry to have its conveyor belts found suitable by the Food and Drug Administration for safe food handling under the new Food Additives amendment. For more information, call a BFG distributor, or write *B.F. Goodrich Industrial Products Co., Dept. M-196, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

CONVEYOR BELTS

Tips to Management

Armour OKs automation pay

. . . Business flops analyzed

. . . Value of 'change'

Armour Tapped for TAP

As part of what must be considered the most significant labor contract in many years, Armour & Co. has agreed to provide some 15,000 workers with "technological adjustment pay" (TAP) should they be laid off because of plant or department closings. In effect, historically pattern-setting Armour will pay $65/wk. to displaced workers for a limited period of time if no transfer is available.

Under a 3-yr. contract signed with the Packinghouse Workers and the Meat Cutters, packer will first provide a 3-mo. notice of an intended close-down after which all employees will be guaranteed full pay during the succeeding period. Employees with 5-yr. seniority and under 60 yr. of age have the option to select either severance or TAP.

To become eligible, an employee must register for transfer to another plant. TAP payments, less unemployment compensation or earnings from other employment, will be made for 26 weeks to employees with 5-15 years of seniority; 29 weeks for 15-20 years; 33 weeks for 20-25 years; and 39 weeks for those with over 25 years of service. If, after receiving TAP, an employee declines a transfer, TAP payments and company-paid premiums will be deducted from his severance pay.

TAP, along with a number of other concepts in the new contract, was credited to the efforts of the Armour Automation Committee. Joint labor-management group, set up to seek solutions to problems posed by automation, will continue to function.

Armour's TAP agreement is viewed as a major and practical stride in solving automation manpower problems, although the unions are still expected to continue to press for their own solution—a shorter work week.

Guide to Small Business Failure

Lack of management know-how, personality defects, and under-capitalization were the chief causes of failures in 40 of 81 newly-established small firms studied by the Small Business Administration.

Results of the survey, taken in the Providence, R. I., area, are included in the SBA's second book in a continuing Small Business Research Series—"The First Two Years: Problems of Small Firm Growth and Survival."

Report reveals that motivation for starting a business and for making management decisions often is spur-of-the-moment choice, rather than logic. Moreover, management experience plays a greater role in the success of a small business than occupational experience. Significant also was the role of one personality trait—persistence.

Who Says Low Turnover's Good?

A certain amount of turnover among management personnel is a desirable thing, according to a recent study by the Assn. of Casualty & Surety Companies of New York.

Report says low figures might push your firm's thinking to stagnation, especially if these figures are created by over-aged, incompetent employees who lack other outside opportunities or are there because of a hesitancy to fire. Some degree of turnover, study explains, puts new blood in the organization, measures the quality of recruitment, and evaluates the overall quality of general supervision.

NLRB Upholds 'Publicity' Boycott

Long-run effectiveness of the Landrum-Griffin Bill's secondary boycott ban may be seriously in doubt if a recent NLRB decision still stands after Supreme Court appeal. Board decided that union distribution of handbills at the premises of secondary employees is not picketing and therefore not a violation.

Case revolves around the Teamster-struck Lohman Sales Co., Denver tobacco and candy distributor. Union distributed handbills at drug stores and other retail outlets urging customers not to buy goods obtained from Lohman. Board ruled that mere handbilling is not picketing and is protected by the "publicity" proviso to the secondary boycott section added to the Taft-Hartley Act by the L-G amendments.

Barriers to Innovation Progress

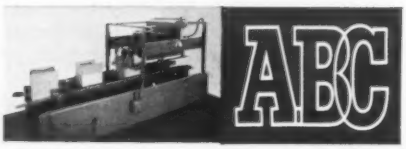
"Innovation is the vital spark of all man-made change, improvement, and progress," states W. T. Brady, chairman and chief executive officer of Corn Products Co. But he points to six organizational factors which can inhibit needed innovation:

- **Over-centralization of power and control.**
- **Lack of planning.**
- **Building of little empires.**
- **Spreading of fear and anxiety.**
- **Limited loyalties.**
- **Poor communications.**

Aside from these blocks, Mr. Brady points to two other major barriers—the basic cultural distaste for innovation and the individual's own pattern of living far below his creative limits.

see you at the show

See the Dialmizer. It's the automatic sealer with the hermetically sealed pressurized glue system. Dial glue spread desired. No daily cleanup required. See you at the show. Okay?



DIALMIZER AUTOMATIC CASE SEALER

A-B-C PACKAGING MACHINE CORPORATION
P.O. Box 1146, Clearwater, Florida

From farm to factory to office, Teamsters gear campaign to . . .

To Alert Industry

What happens in union organization of farm and factory workers is extremely important to management in the food industry. It is to alert management to the aims, ambitions and policies of labor leaders that this article was developed by FE.—*The Editors*

'Organize the Unorganized'

. . . and the food industry seems to be a prime target for ambitious Jimmie Hoffa. Early returns: Some wins but flops and revolts as well—plus strengthened AFL-CIO reaction and counter-strategy

HAVE YOU met James R. Hoffa? If not, it might be worth your while to be prepared—because he definitely wants to meet you.

As food industry management, you'll probably be hearing a lot from and about the ambitious Teamster leader. He's pushing hard for your industry and indications are that it's going to mean additional pressure on you if your plant is not organized, or union vs. union hot wars if it is.

To get a direct line on their thinking and plans, FOOD Engineering's editors interviewed Teamster officials at the IB of T's Washington headquarters. Based on what Hoffa and his aides had to say, plus recent developments and Federation reaction, here's how things are shaping up in food industry labor:

- **Concentrated efforts** by the Teamsters, under the direct control of Hoffa, to organize what he considers to be a "badly unorganized" industry.
- **Increased attempts** at penetration by the IB of T into production, white collar and farm areas.
- **Stiffening resistance** by the AFL-CIO against potential Teamster raiding via better organization, new industry councils, a strong membership campaign of its own, and ready backing for Teamster local revolts.

Harold Gibbons, Hoffa's executive v.-p., has stated that the food industry will help make the most news in future Teamster organizing. Add to this the free hand given to Hoffa at the union's recent Miami convention, and you've got the makings of a concentrated campaign.

Teamsters have openly announced that they're going "to organize any plant or group that wants to join the Teamster ranks" --be they Federation members or not. Some Federation officials claim Hoffa's plan to "organize the unorganized" actually means organizing anyone that is not already a member of the Teamster union, now pegged at 1,700,000 per capita membership.

Planned Strategy

Says Hoffa: "We'll add additional organizers to our staff, go into rural communities, penetrate the South deeper than ever, and go into politics on a precinct, block-by-block basis." Political action is a major theme with the IB of T now and the union president promised to give the union "legislative machinery second to none anywhere in the U. S."

Organizationally, the Teamsters are expected to develop several new industry divisions such as bakery workers, farm workers, etc. Targets are no longer just truckers and warehousemen. "We already control the back end of the shops," says Hoffa. "We want to organize the front end, production, for our own stability."

If you're worried about the effect these plans might have on your plant, you're not alone. The AFL-CIO views Hoffa's plans as a serious threat. And they're trying to do something about it.

Federation's summer convention officially chartered a Food and Beverage Trades Dept. It's purpose is reported to be to "deal with the special problem and concerns of AFL-CIO affiliates in the food and beverage industry." This is an attempt to alleviate internal fights and jurisdictional disputes among Federation members in the food industry. But it also means they (nine separate unions form the new department) are getting together to fight Hoffa raiding and organizing at every turn and, at the same time, boost their own influence and membership.

This "superunion" includes: American Bakery & Confectionery Workers; American Federation of Grain Millers; Distillery, Rectifying & Wine Workers; Hotel & Restaurant Employees & Bartenders; Amalgamated Meat Cutters & Butcher Workmen; Retail, Wholesale & Department Store; Retail Clerks; United Packinghouse, Food & Allied Workers; and the Seafarers.

Thus far, Hoffa's organizing campaign has taken several steps forward but a few backward as well. Powered by his well-organized truckers, he's gained a foothold in negotiations for production people in a variety of areas. Local unions chartered since '58 include several food processing employees. In Western Pennsylvania, the IB of T won a contract for a group

JACK L. MISCHOU
Assistant Editor, "Food Engineering"

"We'll add additional organizers to our staff . . ."

of dairy farmers. And egg and poultry farmers in New Jersey succumbed to the Hoffa influence.

But most notable recent success occurred in California where he won a farm contract with one of the state's largest growers. He did it at about the same time that the Federation announced it was abandoning a 2½-yr. campaign, at a cost of $500,000, to organize the area's agricultural industry. Under the Teamster contract with Bud Antle, the union will represent workers who harvest lettuce, spread cartons in the field, load the trucks, and do other jobs in process.

Aside from this success, Teamster officials are working hard to organize 110 other companies in the field. Growers are viewing a concerted Hoffa campaign with serious alarm.

Key to Power

How did Hoffa succeed where the AFL-CIO failed? Actually, he's got several things going for him in this particular area. He already had contracts throughout California and Arizona covering drivers who carry produce from the field to vegetable cooling sheds. Add to this the backing of the oft-criticized but still powerful Harry Bridges, head of the International Longshoremen's & Warehousemen's Union and a West Coast labor leader, who told the Miami convention that California farm workers would not be successfully organized until the Teamsters undertook such a campaign.

Several grower-shippers, in an effort to ward off Teamster moves on their farms, have matched some benefits in the Antle contract—but not all by a long shot. And leaders of the Council for California Growers have emphasized that they are not lowering their defenses one bit just because one organizing attempt (AFL-CIO) has failed. They're readying themselves to hold the line against any topsy-like union wedges.

To the Henhouse

In the South, Teamster attempts to gain the favor of the primarily unorganized poultry industry have met with stiff resistance. Using a strategy that is significant because of its potential implementation in other areas, Hoffa approached the poultry industry as management's friend. He offered to provide over $1-million for a promotion and advertising campaign persuading American housewives to buy more chicken and prop up an otherwise declining industry.

At press time, a poll of most area poultry managers indicated that Hoffa would not be welcome, million dollars or not. Many claimed the move was actually an attempt to organize the management, not the employees, of the poultry industry. Teamsters replied that the offer would remain open, pending development of an industry promotion organization.

Most observers, including the majority of poultry processors, considered the move as a new Hoffa organizing technique. General feeling is that its eventual success or failure will have repercussions far outside the barnyard.

At the Miami convention, the Teamsters Union rewrote its charter to authorize the organization of all unorganized workers. Almost unlimited funds are ready to push the organization on an intensive level. Funds can be used for highly-paid organizers in a target industry, such as yours, or as the poultry situation suggests, be used to create an aura of good will prior to actual organizing.

Federation Harmony?

If Hoffa doesn't get back into the Federation, he might try to

Teamster Union Officials Voice

Q. What makes the food industry such a prime target for increasing Teamster membership?

A. We're going to organize anyone we can—and the food industry is certainly one area where employees need a union. It's badly unorganized and in need of efficient worker representation.

Q. You have promised to "organize the unorganized" in every capacity—from farmers to production workers to white collar personnel. Aren't these areas a long way from trucking?

A. Employers can no longer accept the IB of T as representing only trucks and warehouses. Failure of the AFL-CIO to organize the unorganized workers in America has given us a responsibility, a duty, to organize, regardless of jurisdiction.

Q. Won't you run into AFL-CIO territory by attempting to organize production employees?

A. No. We will only attempt to organize where there is an interest on the part of the unorganized workers. We will not do any raiding of other unions.

Q. How do you pick targets for organization?

A. If we know there's a substantial number of people interested in joining the Teamsters Union, we'll send organizers into the area. They'll work with a committee of workers who are the key men. In addition, we often make a financial analysis of the employer. We've got to know all sides of the situation before we throw in Teamster resources.

Q. What plans do you have for organizing the agricultural workers?

A. We're going in and get decent wages and conditions for these people. We've already done it in California—and that's only the beginning.

Q. Will attempts be made to merge with other food industry unions such as the Bakery & Confectionery Workers and the Amalgamated Meat Cutters & Butcher Workmen?

A. We will consider a request for affiliation from any union that wants to join the Teamster roles. Certainly, a lot of new members will come from the food industry.

Q. Why are you opposed to piggyback operations even though it can often improve and speed up the food distribution operation?

A. Piggyback is not opposed by the Teamsters Union or by the trucking

Plans for Food Industry . . .

industry. However, selective rate-cutting by railroads to destroy truckers and other competitors in the transportation industry is opposed because it makes a mockery of our free enterprise system, jeopardizes our national defense effort, and unfairly destroys Teamster member jobs.

Q. Since a strike halting food processing and distribution can have serious effects on the public, do you feel there should be some system of compulsory arbitration in case of such a shutdown?

A. Compulsory arbitration could lead to eventual government domination of the entire free collective bargaining concept, and the Teamsters Union is unalterably opposed to it in any form. However, means should be found to solve problems or disputes which create a clear danger to the national health, welfare, and security.

Q. Won't simultaneous terminations of all Teamster contracts in the trucking industry give you dictatorial power and introduce the possibility of a national strike?

A. There will never be a nationwide strike in trucking. However, we expect to achieve a nationwide contract for road and city drivers and dockmen within the next few years. This is necessary because of the punitive, restrictive Landrum-Griffin labor law.

Q. Why do you want to get back into the AFL-CIO when you seem to be doing well without it?

A. We feel that we belong in the house of labor. We helped build it. We are the largest single labor organization. Unless the present AFL-CIO wishes to have a weakened Federation, they will take the Teamsters Union back in at an early date.

Q. How important do you feel the loss of the Chicago and Cincinnati locals will be as indications of internal Teamster revolt?

A. Let us make clear that there is no "internal Teamster revolt." The situation in Cincinnati has been going on since 1953, and the Chicago situation has been going on since before 1950. Neither has been settled yet, and it will be some time before they are finally settled.

(Ed. Note—The NLRB has overruled Teamster objections and certified an independent union as bargaining agent for the two Chicago taxi locals who broke with the IB of T.)

build a federation of his own. Some of the ingredients are there as witness the independent BCW, along with a few in other industries. Formed after a break with the Federation, 80,000-member BCW has been having its share of problems. Not the least of these were the tactics of James G. Cross, forced to resign as president following corruption charges.

Late last month, the BCW was scheduled to hold a forced convention to elect officers. Two factions had been at odds in the union, one pushing for a return to the Federation, the other considered eager for Teamster alignment.

Hoffa's position is much more secure that it would be were the AFL-CIO craft and industrial unions devoid of dissension. Interunion warfare has become increasingly more obvious and calls by Federation leaders have gone out for a solution to jurisdictional disputes.

The new Food & Beverage Trades Dept. is expected to make rapid strides for Federation harmony and units, at least in this industry. Representatives of the various affiliates were expected to issue a call for a first convention, tentatively scheduled to be held just prior to the AFL-CIO convention in December at Miami.

Here are some of the objectives of the department as listed by Dan E. Conway, president of the American Bakery & Confectionery Workers and the first to propose the new food union alliance:

. . . **To assist affiliated unions** in securing improved wage, hour, and working conditions through collective bargaining.

. . . **To coordinate activities,** functions and interests of affiliated unions.

. . . **To establish research,** legal and public relations activities.

"We want to organize the front end, production . . ."

. . . **To create local** food and beverage trades councils to be chartered by the department.

Teamster Locals Stir

This new department, if both it and the Federation back local Teamster breaks, may be a strong deterrent to Teamster efforts in the food and beverage industry. Local Teamster revolts, notably in Chicago and Cincinnati, have caused many sources to predict the start of a wide-spread revolution within the Brotherhood.

Teamster officials, however, claim that these breaks are unique. In Chicago, discrimination (no Negroes on the local executive council) is cited as the reason behind the cabdriver revolt. In Cincinnati, Teamsters claim situation was created by long-time enemies of Hoffa who had to make a move sooner or later.

Two food industry locals in Cincinnati, the dairy workers and the soft drink drivers, form the largest segment of the 4,000 member break. Dairy workers, led by Hoffa-foe James T. Luken, are awaiting an NLRB election for a final decision. The soft drink drivers have already been chartered by the Federation's United Brewery Workers.

Hoffa and Luken engaged in a knock-down, drag-out fight over Cincinnati radio and TV stations as well as in local meeting halls. Some observers felt that Hoffa's personal appearances only brought additional publicity to the Cincinnati revolt and provided the impetus for other locals to bolt if they so desired. However, the Teamsters don't take any membership loss lightly and will campaign right to the end to reverse the situation.

Any loss in the important food and beverage industry could be a big roadblock to today's speeding Teamster chieftain, James R. Hoffa. (End)

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Available to all qualified engineers at no cost is an easy-to-read, five-window sliding computer. It instantly calculates conveyor capacity, component horsepower capacity, capacity conversion, material hp., and friction hp.

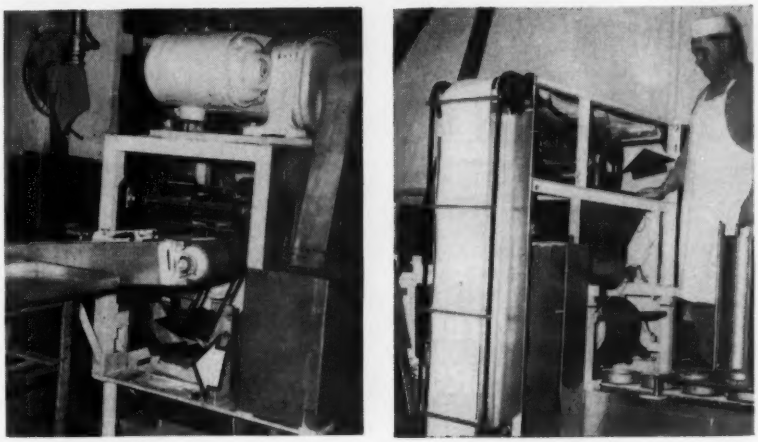
Forward requests for the calculator on company letterhead to *Thomas Conveyor Co., Box 11127, Fort Worth, Tex.*

Effective Floor Drainage

Pitching the tile floor in two directions from its center high point assures complete draining of wash water in our 80x120-ft. processing room at Orange Crush Co.

The floor is pitched 2 in. per 10 ft. Water quickly drains into open gutter drains (6-in. wide) along the two outer walls. Drains are pitched 4 in. per 8 in.

We've also been able to easily place our equipment (blenders, homogenizers, fillers) by leveling two instead of four legs. And our employees, working in the center of the room, no longer stand in wash-down water.—*C. W. Richard, Production Manager, Orange-Crush Co., Evanston, Ill.*



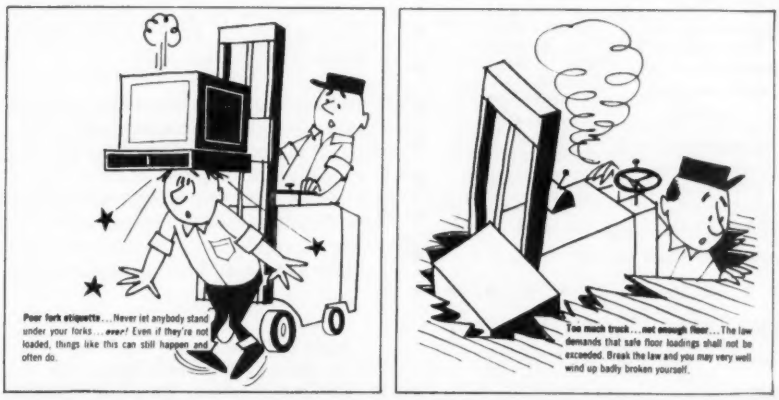
98% OF TRIMMINGS from pie maker (left) are returned to dough hopper (right).

Recirculation System Recovers Dough Trimmings

Rather than waste the appreciable amount of dough trimmings from pies made on its high-speed equipment, Pennsylvania Frosted Foods Co., Southampton, Pa., devised the above setup for recovering and reusing the dough.

As shown in left photo, trimmed dough drops off the end of the pie conveyor and onto a belt (arrow) that runs beneath the pie machine. Latter advances the dough toward the hopper (right photo).

Here, trimmings drop onto another conveyor that ultimately runs up one side of the machine. Spaced aluminum extenders (arrow) on the conveyor return the dough to the hopper. This device recovers almost 98% of the trimmings.—*P. Lance, Phila.*


Poor fork etiquette... Never let anybody stand under your forks ... ever! Even if they're not loaded, things like this can still happen and often do.
Too much truck ... not enough floor ... The law demands that safe floor loadings shall not be exceeded. Break the law and you may very well wind up badly broken yourself.

POSTERS such as these are being used in food plants to reduce accidents involving industrial trucks. A series of 16, entitled "Think Safety," is available from **Automatic Transportation Co., 101 W. 87th St., Chicago.**

Fluorescent Lighting Units For High-Humidity Areas

What type of fluorescent light fixtures best withstand ballast failure, corrosion, etc., under conditions of high humidity?

Any light requires some protection under these conditions. For high moisture locations, the vapor-tight or vapor-proof (RLM) units manufactured for this type of service are best, but are expensive. They are fitted with tight gaskets and can be obtained with either soft, or shock- and heat-resistant glass covers.

It has been suggested that the "Craft Light" might be suitable for such use and would be less expensive. This unit is a fluorescent

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strip light, vapor tight, with an acrylic or plastic cover, but without a reflector.

Another possibility is the outdoor-type fluorescent, such as is used in some newly constructed service stations. It is fitted with a rubber grommet or gasket on the tubes for moisture protection. Ballast is enclosed in the channel for protection. However, this type must be cleaned frequently to prevent interference with lamp starting.

Standard industrial fluorescent units can be modified for use under high-moisture conditions, but the conversion usually costs more than purchasing a vapor-tight unit. Moreover, modifying a standard unit may remove it from the underwriter's laboratory approval.—*E. S. Doyle, National Canners Assn. Laboratory, Berkeley, Calif.*

Monitors Can Fill

This production-line monitor indicates and records the running average fills of containers. Individual can weight is not determined, but its effect becomes part of the record.

Chart analyzer shows the average weight over any filling period, as well as the times when upper and lower control limits may have been exceeded. Recorder scale is calibrated to indicate a full-scale deviation of 0.5 oz. per can, thus a deviation of 0.01 oz. is easily detected.

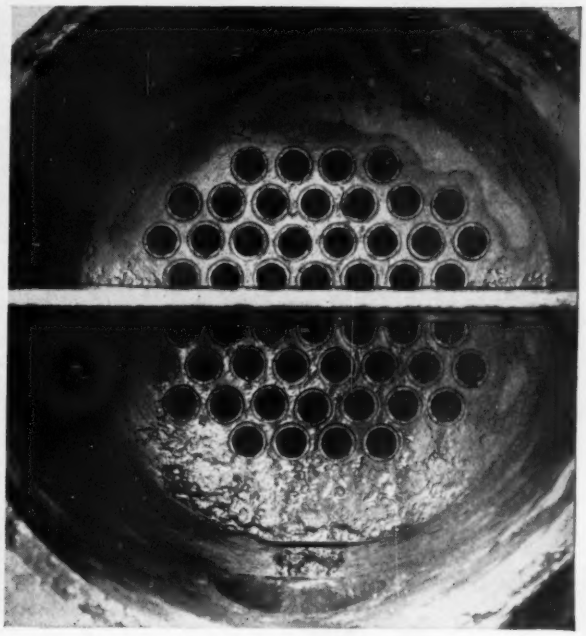
System is made by *Devices Unlimited, Inc., 1209 El Segundo Blvd., El Segundo, Calif.*

Palletizing now speeds inbound cans directly to process lines, eliminates manual handling. Conveyor at receiving dock sends pallet loads of empties to depalletizer, which automatically feeds rows of cans to processing conveyors. Typical systems handle up to 500 cans per min.

CORRECTION: In the Aug. '61 article on Microwave Freeze Drying, life of the equipment's power tube was listed as 300 hr. It should have read 3,000 hr.

Descale equipment quickly, safely —without dismantling!

BEFORE—This condenser was badly clogged with hard-water scale. Mechanical cleaning of the tubes would have been difficult, time-consuming and costly. To use hydrochloric acid would pose danger to nearby equipment and personnel.



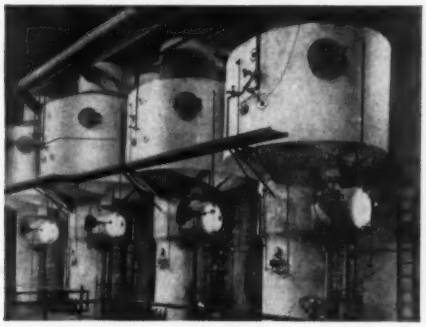
AFTER—It was easily cleaned *without dismantling* by circulating a water solution of a sulfamic acid-based cleaner for an hour. Short downtime, *no* danger to equipment and complete safety for personnel!

Use a dry-acid cleaner based on Du Pont Sulfamic Acid

They're effective. Dry-acid cleaners dissolve hard-water scale and certain food deposits found in cooking vessels, evaporators, heat exchangers, pasteurizers, etc. Yet they're much less corrosive to metal than hydrochloric-acid cleaners, particularly on stainless steel!

They're easy, safe. Just dissolve the solid cleaner in water and circulate through the equipment. Often the acid can be added dry. No danger of broken carboys, spilled liquids, or toxic fumes—glasses and gloves the only protective clothing needed!

They're economical, fast. 1 lb. of dry cleaner does the job of several lbs. of liquid acid—you save on shipping, handling, storage and downtime because there's no dismantling. You clean in place!



Food process equipment like these evaporators is easily descaled with a cleaner based on Du Pont Sulfamic Acid. No dismantling—the cleaner is circulated with the evaporator feed pumps.

Ask your supplier of maintenance cleaners for information on dry-acid cleaners, or send the coupon for booklet and names of formulators offering these products.

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*Company*_____

*Address*_____

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Doing It Better

SARATOGA DAIRY, INC.

Solves Metering Problem

Switching from batch to continuous butter - making posed a knotty salt-metering problem for Saratoga Dairy, Inc., Saratoga Springs, N. Y.

Formerly, measured amounts of salt could easily be added on a batch basis. Now it has to feed continuously, accurately, and uniformly. This has been accomplished by synchronizing the delivery of salt from a vibrating-screw feeder with the flow of butter.

Pulverized salt is fed through a vibrating hopper. Vibratory actions of both hopper and feed screw quickly bring the mass of salt to reproducible density for feeding accuracy of 1%. Delivery of salt is 3.2 oz. per min., which is 1½ of the butter flow rate.

The feeder was supplied by Vibra Screw Feeders, Inc. Clifton, N. J. **(202)**

J. H. ALLISON & CO.

Speeds Carton Handling

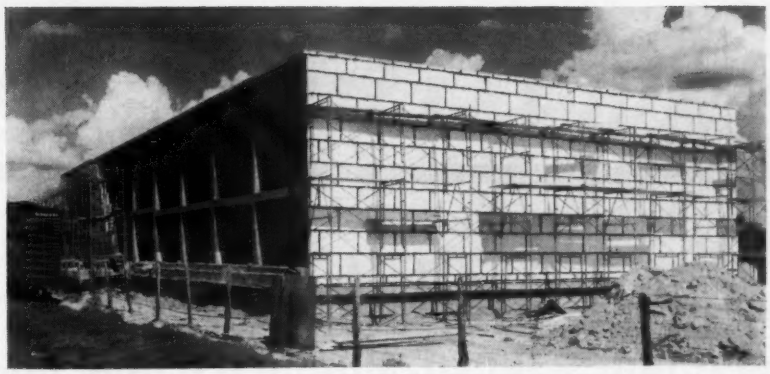
This high-speed vertical lift eliminated an expensive handling bottleneck at J. H. Allison & Co., Chattanooga meat packer.

Problem was to find a better way of moving cartons of product from the ground-floor production area to first-floor shipping. Old method was to load cartons onto hand carts and push them across the floor to an elevator. Then, cartons had to be re-handled and accumulated on the first floor. Entire operation was wasteful of manpower, time, and space.

Solution was the continuous vertical lift called an Escaveyor. In operation, it self-loads six cartons per min., lifts them straight up, and self-unloads. Because of the unit's compactness, cartons can be run to the lift by gravity. Moreover, accumulation space on the floor above was provided without any major changes to the building.

The lift, which can handle up to 10 loads per min., is made by Standard Conveyor Co., N. St. Paul, Minn. **(203)**

VERTICAL LIFT saves manpower, time, and space.



TWO LAYERS of foam plank act as insulation and structural member in cold-storage-room wall. A gunite coating will be applied to both wall surfaces.

JENORD COLD STORAGE CORP.

Makes Double Use of Foam Insulation

Expanded polystyrene foam does double duty in the Jenord Cold Storage Corp. warehouse in San Antonio, Tex.

First, it acts as an efficient insulator that keeps building temperature at —15F. And it's a structural agent in the 20-ft.-high walls of the 59x143 ft. facility. Foam planks form an 8-in. core of a 10-in.-thick wall. The remainder is gunite, a mixture of cement, sand, and water, applied by pneumatic pressure to both outside and inside of the wall.

The foam's rough cellular surface enables applying the gunite with about half the usual "rebound" loss, and it has its own vapor barrier. No added protection against internal condensation of water vapor was necessary.

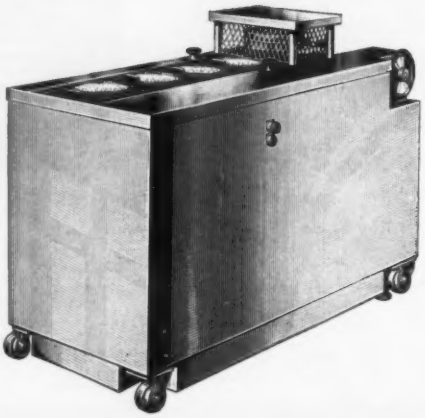
In construction, wire mesh was fastened to support pillars to act as a reinforcement binder for the insulation. Four-inch-thick planks were fastened to the wire to form the first insulation layer, then a second layer was cemented to the first to form the 8-in. core. After another layer of wire mesh was fastened to the outside of the wall, the gunite was applied.

Installation cost of foam and gunite was $1.93 per sq. ft. The building has been subjected to winds of near-hurricane intensity without damage.

The insulation (Styrofoam) is made by Dow Chemical Co., Midland, Mich. **(201)**

MODEL IV-M CLOSURE MACHINE

The ultimate in versatile production equipment for the medium volume food processor is made available with the Model IV-M. Basic mechanical motions and proved production experience have created a machine capable of handling a variety of products in aluminum foil containers with consistent quality closure.



EKCO-ALCOA PACKAGING EQUIPMENT
combines speed, simplicity, dependability, versatility

High speed packaging equipment, custom engineered for medium or high volume users, is available from Ekco-Alcoa. It's another reason for choosing our aluminum foil containers. Ekco-Alcoa, leading foil container manufacturer, offers production packaging equipment to handle a variety of liquid or dense products. Consistent quality closures and the ability to handle a wide range of package sizes and shapes are among the outstanding features of Ekco-Alcoa's thoroughly tested and proved packaging equipment. Minimum space, maximum operator safety, easy accessibility for cleaning and maintenance, and variable packaging speeds are other reasons for connecting Ekco-Alcoa equipment to your line. For a complete brochure describing Ekco-Alcoa packaging equipment, write to our Packaging Equipment Division at the address shown below.

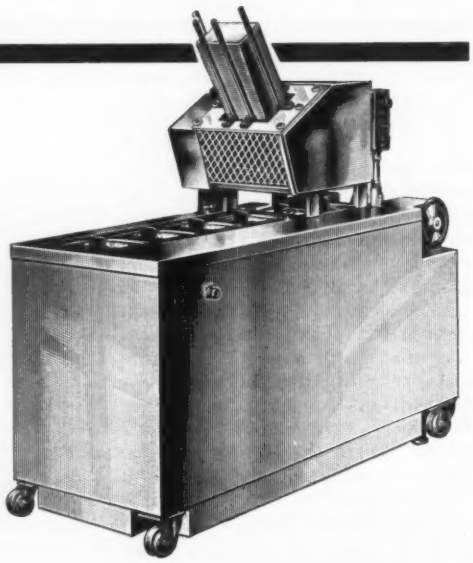
The Plus Container

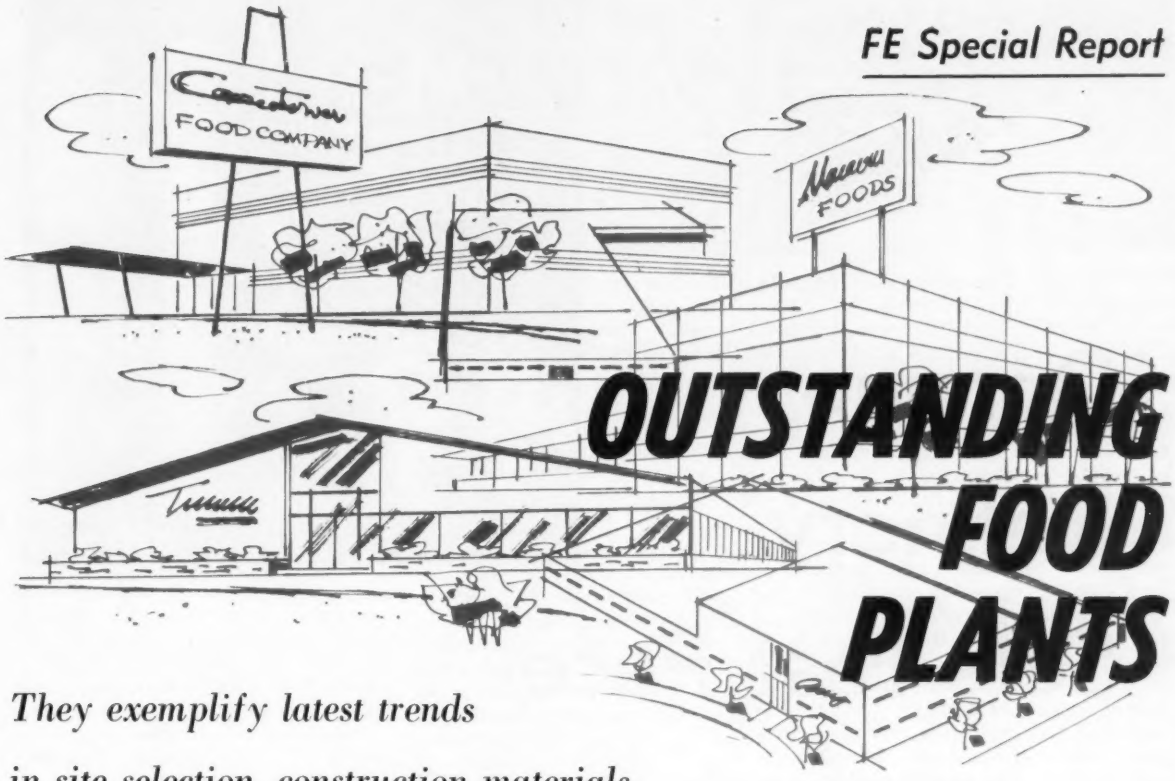
EKCO-ALCOA CONTAINERS INC.
GENERAL OFFICES: WHEELING, ILLINOIS

EKCO is the registered trademark of Ekco Products Company; ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

MODEL VI AUTOMATIC CAPPER & CLOSURE MACHINE

The Type VI Machine combines the experience gained over five years of actual production packaging of aluminum foil containers. It is the only mechanical equipment available for automatically capping and closing foil containers that has been thoroughly tested and proved prior to marketing.





OUTSTANDING FOOD PLANTS

They exemplify latest trends in site selection, construction materials and techniques, designs for efficient production

ADVANCES in non-processing features of food factories are coming at an accelerated pace. They are just as significant as production-line improvements in the profit and growth performance of your company.

For these reasons, FE presents this special report on several outstanding new food plants. Large, medium-size, and small plants are discussed — not just the best of the big. Here are sample highlights:

Plant Location — Whitman's new surban plant solves production and handling problems. Gerber builds in Southeast to cut distribution costs.

"Outside" Construction — American Sugar cuts costs by putting process equipment and boilers outdoors.

Efficient Layout — Libby's 13 straight-through production lines turn out 850,000 cans of meat a day. Twenty varieties are produced.

Quick Erection — Dakota Brewing saves $250,000 by efficient prefab construction. Latest insulating techniques are used in freezer rooms at Vahsling and Breast O'Chicken.

Sanitation — Electronic dust control at Whitman, metal walls at General Mills, and special wall and floor construction at Gerber and Greeley-Capitol.

Low Maintenance — Windowless outside metal walls at General Mills and Salada-Shirriff-Horsey.

Utilities — Whitman's new 277-v. fluorescent lighting and dual-service electrical system with automatic tie breaker; Gerber's advance planning for utility line location and expanded capacity; Libby's centralized power plant for efficient steam generation and distribution.

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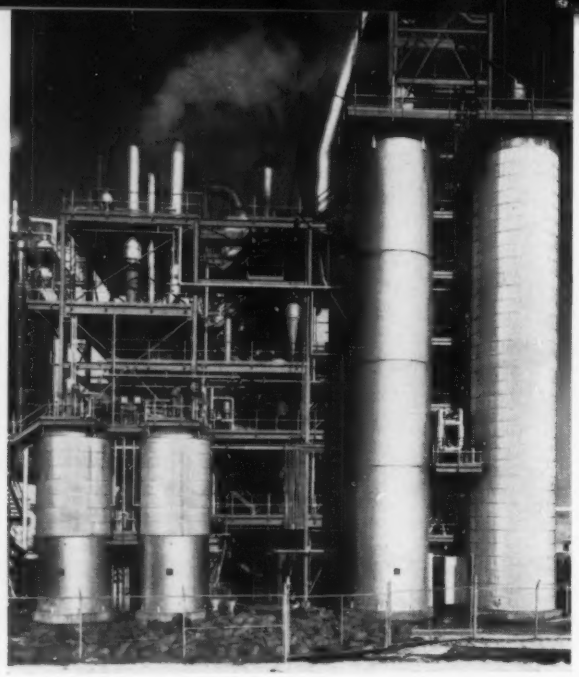
FE Staff



SIMILAR in appearance to petroleum refining is this Continuous Adsorption Process. Greatly advancing sugar refining, this patented process effects very big savings and features outside construction.

Domino Refinery Sets Fast Pace

Ingenious design and engineering permit refinery's construction at minimal cost. Other features are: High product quality, low operating costs, maximum sanitation

EFFICIENT and economical to operate. That in simplest terms describes American Sugar Refining Co.'s new refinery located in the Charlestown section of Boston, Mass.

This new plant, replacing American's 100 yr.-old South Boston plant, was designed to achieve minimal construction and operating costs. This was done by: Building arrangement, equipment grouping, outside construction, high-level sanitation and maintenance, bulk materials handling, and automation.

The Refining Center building houses the entire refining process except the adsorption phase. It also includes the refinery offices, engineering offices, and laboratory. Adjacent but connected are buildings for: Raw sugar storage; refined sugar storage; liquid sugar storage and shipping; packaging; warehousing and shipping; Sales, Accounting, and Personnel offices; cafeteria and first aid room; and, steam and power generation.

Extensive use of glass and building tile gives plant a clean look as well as providing easy maintenance. Plant, with a capacity of 2-million lb./day, numbers 200 operating- and 60 business-personnel.

Efficiency by Design

Producing consistently high-quality products at low operating costs calls for a skillful combination of machinery and methods. Here are some of American Sugar's innovations:

► **Gravity flow,** wherever possible in the refining process, minimizes the number of long piping and conveyor runs.

► **Grouping similar types of equipment** permits efficient use of labor to oversee each process step. For example, mechanical filters, clarifiers, and centrifuges are on one floor. Most of the pumps are on another floor with their respective feed tanks directly above. Granulators are directly beneath centrifugal machines feeding them.

► **All packaging equipment** is on one floor for maximum labor efficiency in this department.

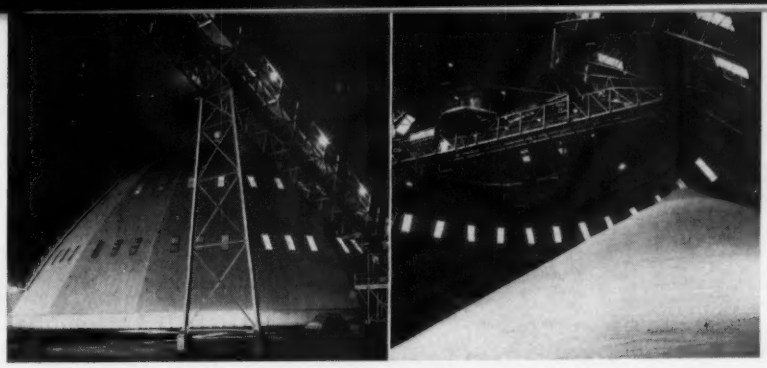
► **Plant sanitation** is easy and effective because: Tanks are equipped with overflow lines and alarms; dust-producing equipment is enclosed and provided with dust collectors; vapor-producing equipment is enclosed and vented; pumps are mounted in specially constructed, pitched wells which drain self to collecting sumps; and, process equipment is mounted flush with the floor by means of rounded concrete sills.

► **Bulk storage of process chemicals** allows easy removal and transporting by pneumatic and slurry transport systems.

► **Raw sugar receiving** was designed primarily for receipt from a self-discharging ship. Ship-mounted clam-shell buckets discharge into dock-side traveling hoppers which feed onto belt conveyor. Discharge rate is 675 tons/hr.

► **Dome-shaped, aluminum-sheathed warehouse** stores raw sugar after automatic weighing by a mammoth scale which can handle approximately 15 tons/drop. This parabolic warehouse (see photo) has a 238-ft. base dia. and

an apex height of 107 ft., with a 60-million lb. capacity. Sugar is conveyed to the apex where by a rotating distribution belt it is evenly distributed over entire warehouse area. Raw sugar discharging and storing system is interlocked so that malfunction of any component will automatically shut down all equipment preceding it.



DOME-SHAPED, aluminum-sheathed structure stores raw sugar. Parabolic warehouse (at left) has 238-ft. base dia., 107-ft. apex hgt., and 60-million lb. capacity. Sugar, coveyed to apex (at right), is distributed evenly over warehouse area by rotating distribution belt.

Built-In Controls

Complete automation in processing and in controls is the key to this new refinery's efficient operation. A central control room is the brains of the refining process. In this area are graphic panels showing process flow and operation of the major refinery units from raw sugar warehouse to refined sugar screening. Panels also feature: Indicator lights for pumps, conveyors, etc.; cycle and shut-down alarms; indicating- controlling instruments for critical process variable such as solids content, flow-rate, pH, temperature, etc.; controls for decolorization and pan boiling.

A process supervisor oversees the refining processes from the central control room. He is assisted by others who maintain close communication with him from different areas in the plant. When trouble arises, one of these assistants is dispatched to the trouble spot.

Separate control panels for certain processes are provided in respective areas where more intense local supervision is required. For example, the mechanical filtration station has one to insure absolute clarity of sugar liquors prior to further processing. The char reactivation kiln and the centrifugal machines have separate panels for closer control. The refined sugar distribution system has its own control panel amidst the packaging, warehousing and shipping operations.

Other Plant Features

1. Unique in design and revolutionary in sugar refining is American Sugar's patented Continuous Adsorption Process (CAP). Constructed on the outside, somewhat like a petroleum refinery, the CAP unit comprises three columns, 12 ft. in dia., with bone char beds 40 ft. deep. Striking difference when compared to the conventional stationary bed operation is the countermovements of the sugar liquor moving upward in the column while the bone char moves downward.

The CAP system, in comparison, has effected direct savings as follows: More than 50% in capital investment; over 90% in operating costs; over 50% in fuel costs for bone char reactivation; more than 75% reduction in bone char inventory; and, over 80% reduction of in-process liquor inventory.

In addition, it has improved product clarity, simplified other refining steps, and provided easier sanitation maintenance. Process appears suitable for beet sugar, corn sugar and syrup refining.

Dramatic change by CAP process is in labor requirements: Now services of only ½ man per shift are needed to former system's need for 15 men per day.

2. High-speed packaging is used for all filling and sealing operations. Control panel in refined sugar distribution center automatically controls sugar being fed to various packaging lines from storage bins and silos.

3. Warehouse features automatic palletizing of all production prior to storage. Capacity is 10-million lb of refined sugar. Its one-floor layout facilitates storage and pick-up for delivery.

4. Air conditioning has been installed in all offices, the laboratory, and the packaging area. In addition to contributing to employee comfort, the air conditioned packing area has minimized mechanical maintenance and cleaning.

5. Shipping bulk and packaged sugars is by rail and truck. Facilities include indoor loading of rail cars for both bulk and packaged quantities.

6. Liquid sugars (invert and sucrose) are stored and blended in five 30,000 gal. tanks. Sanitary handling is a designed feature of liquid sugar shipping.

7. Steam is generated by three oil-fired package boilers, each rated at 60,000 lb. steam/hr. Steam is produced at 385 psig for the turbo - generator which supplies all the electricity required by the refinery. Boiler controls include automatic combustion control, automatic oxygen analysis, and smoke detection. Lower construction costs have been achieved by placing the boilers on the outside, with only the firing aisle inside the boiler house.

8. Safety devices installed throughout the plant provide maximum protection. Departments are responsible for training employees and instilling safety consciousness.

9. Quality control operates out of a modern, centrally located laboratory which is equipped to perform microbiological as well as routine chemical tests. It's headed by a technically qualified individual who is staff assistant to the refinery manager. Quality control's function is to maintain a continuous check on processing and product quality. Close liaison with central control room keeps process supervisor constantly informed of lab tests.

Advanced construction concepts and newly-engineered processing techniques have made this Domino refinery a pace-setter in sugar refining. It's significant that this is the first large-scale refinery to be built in the U. S. in almost 25 years.

Big Plant for a Big Job

Operating efficiency, simplified sanitation and maintenance, and employee comfort are dramatic proof of forward thinking in Libby's new Chicago meat-canning plant

A MONUMENT to efficiency and economy is Libby, McNeill & Libby's new giant Chicago plant.

Costing over $10-million to build and equip, the 600,000-sq. ft. plant is on a 54-acre site. Thirteen canned meat production lines turn out 20 varieties of product. In a single shift, annual production can top 6,000,000 cases—an increase of 2,000,000 over its old plant.

Libby also has its own can-making facilities, which can turn out 900,000 cans daily (single shift). Empty cans of six different sizes flow on overhead cables directly to canned-meat production lines. Cans are also supplied to the nearby Blue Island plant.

Every part of the plant is carefully geared to production needs. It's a completely integrated canned meat and can-making installation—the first in the industry on such a mammoth scale.

Raw materials are held in dry storage, cooler, or freezer areas. Products are quickly packaged in cans conveyed from adjacent can-making facilities. Cased goods are automatically palletized for clamp-lift-truck stacking in a 1,200,000-case capacity warehouse.

All production and quality control are under a single plant management. Delays and backtracking are at an irreducible minimum—far below those in their former non-integrated, 9-story plant with scattered operations.

Why the New Plant

When Libby decided to build a new plant, it knew what it didn't want—the old Chicago stockyards' plant.

While Libby techniques have helped shape canning processes throughout the industry, some of the newer improvements and processes just didn't fit into the old building. Operations were scattered (and squeezed) among many floors, a condition not conducive to efficient supervision.

Libby wanted a plant where production could be laid out with complete logic, plus a site with plenty of room for expansion.

It got what it wanted—and more. The handsome new plant features efficient materials handling (FE Sept. '61 p. 37), plus production areas and employee services that stamp it a good place to work.

There are good RR facilities, and the plant is close to the stock yards where Libby purchases a good share of its boned meats. It is centrally located to receive raw materials and distribute finished products. Moreover, there is direct seaway access to world ports via Chicago's Calumet-Sag channel and regional port of Lake Calumet.

An ingenious layout provides flexibility and minimizes handling distances in the single-story, rectangular-shaped building. Wide expanses provide easy flow of materials and people.

Maintenance and quality control have been centrally located for quick accessibility. Processing and case-handling operations are as mechanized as they can be. Entire plant is laid out to maintain good sanitation and employee working conditions.

Other highlights?

... **Indoor railroad track** accommodating 17 freight cars.

... **Shipping and receiving** docks handling a dozen trucks.

... **Movement and formulation** of raw materials electronically controlled.

... **A handsomely decorated** cafeteria inviting employees to relax.

... **A low-cost roof** (in other than plant areas) providing both acoustical comfort and easy maintenance.

... **A power plant** centrally located for efficient steam distribution.

... **Durable maintenance-free** construction materials, such as tile walls.

Building and Grounds

Plant is built around the 13 production lines. Well-planned landscaping dresses up the view from the road. There is parking for 400 cars and room for more if needed.

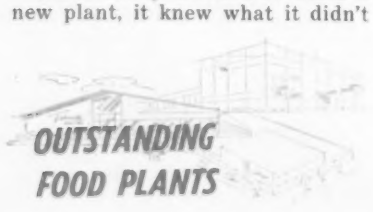
The building is a light steel-frame structure. The plant itself includes manufacturing areas, warehousing, boiler and maintenance rooms, offices, and personnel facilities (lockers, showers, first aid, etc.).

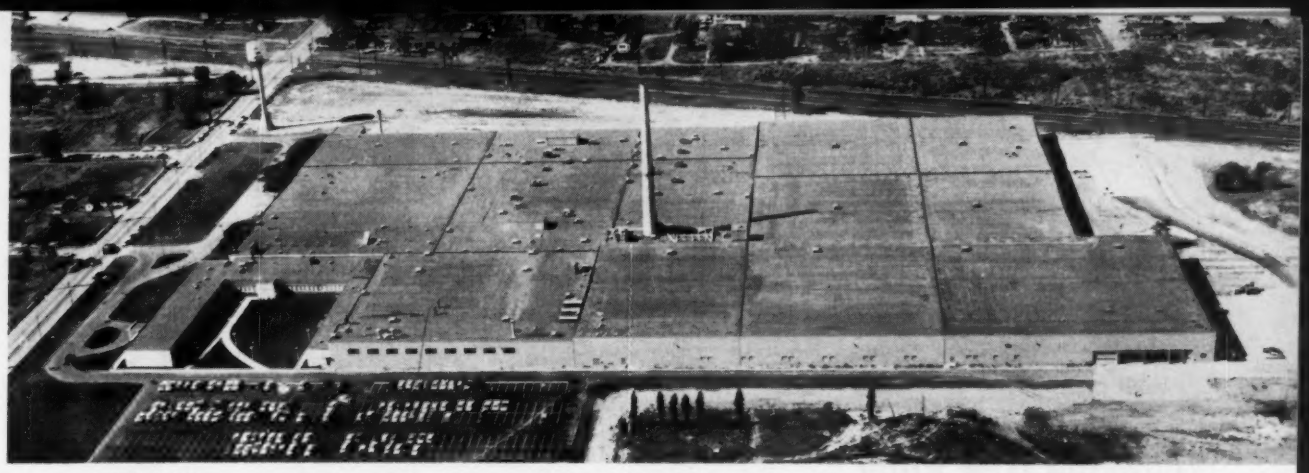
Canned-meat research facilities adjoining the office area include analytical, new-product development, and pilot plant laboratories.

Offices are located in a front-end of the building. An inviting lobby has combination walnut and white marble panels, terrazzo floor and potted plants.

Side walls of the front court area (adjacent to parking) are 4-in. prefabricated concrete slabs outside-surfaced with aggregate quartz in a white cement base. Front wall is surfaced with red brick, above and below aluminum frame windows. Flat-front entrance canopy is column-supported with quartz-surfaced prefabricated concrete slabs.

Above and below side-facing windows are black-slate panels.



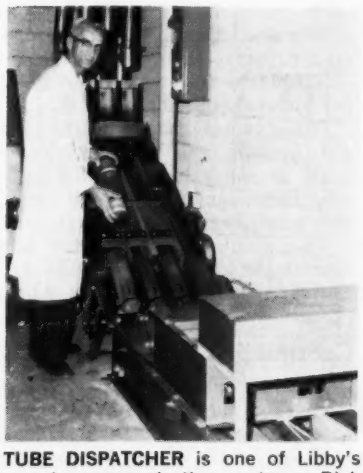


SPRAWLING over some 14 acres, this new Libby plant efficiently integrates meat processing with can-making.

Main body of the plant is windowless, with non-bearing wall of concrete block backing up face brick on the outside. Inside, there is up-to-the-ceiling glazed tile for all areas but warehousing. Interior walls of warehouse and can-making facility are firewalls.

Roof (20-year bonded) is a tar-and-gravel type, with 1-in. Fiberglas insulation. Concrete slabs (2 x 8 ft.) are over steel trusses supported by 10-in. round columns (40 ft. apart). Exhausts, evaporating condenser, and a 2-unit substation (penthoused) are on the roof—out of the way, yet centrally located.

Column spacing is 20x20-ft. throughout processing, warehousing, and storage areas. Lowest chord of trusses is 24 ft., enough to accommodate multi-level conveyors in case packing-sealing area and high stacking of cases in warehouse.



TUBE DISPATCHER is one of Libby's speedy communication systems. Dial-phone actuated, it handles messages and product samples.

Floors are 6-in. poured concrete. In "wet-operation" areas, they are topped with acid-resistant, non-slip type surface-roughed brick.

Washrooms, lockers, toilets, and showers are spacious, well-lighted. And they are located near where some 80% of the personnel work.

Electrical Services

Incoming service—12 kv., which is transformed at an out-door substation to 4,160v. This distribution voltage is further transformed at unit substations to a utilization voltage of 480v.

Four unit substations are mezzanine-mounted. One serves can-making plant, other three are for processing. Capacity is 750 kva. each. There are two dry-type transformers (3-phase, 60 cycle) on each substation. Transformation is 4,160v. (primary) to 480Y/277v.

Lighting levels vary. From 25-30 foot-candles are maintained for warehouse. Where higher levels are needed (processing, office, laboratory) from 55-60 foot-candles are provided.

Fixtures are designed so that top surface reflector's rectangular slats generate air current, thus prevent dust from collecting on inside. Bottom clamps support a plastic shield that prevents broken fluorescent tubes from chance contamination of products.

Plant Services

Primary source of heat is two 80,000-lb. steam generators, automatically controlled. High temperature water is pumped through the plant to unit heaters, radiation panels, etc. Combination packaged boilers (oil or gas-fired) generate 135-p.s.i. steam.

Because public water is high in mineral content, deionization equipment is an important accessory feature. System also deaerates the water. Located under the machine shop floor are three fuel oil tanks, each holding 30,000 gal. A shell-and-tube type unit preheats the oil to 180F.

Air conditioning is provided for employee comfort in the office, cafeteria, labs, and locker rooms. Refrigeration is supplied by four Vilter compressors (350-ton capacity) for holding raw materials at zero and up to 55F. There are also two Fuller ammonia boosters (total 75 tons), and a Freon, multi-zone system (100 ton).

Plant protection isn't considered much of a problem. During hours when plant is down, watchmen are on duty. Plant is 100% sprinklered.

A 2-faced Libby water tank promotes products, while standing fire watch over the plant. It has a king-size can of beef stew and beef hash, one on each side. Both are artistically painted to represent Bunyanesque replicas of Libby's products. It's a corporate image that holds 100,000 gal. of water for instant gravity flow to sprinklers in case of fire.

Process waste goes to three settling-fat skimming tanks. Skimmed grease and solids are trucked away, while liquids are accepted by the municipal sewerage system.

Communication facilities include telephone, teletype, a pneumatic tube-dispatch system, and radio equipment.

A modern machine shop is fully equipped with lathes, drills, shapers, etc. Maintenance department is staffed with electricians, pipefitters, machinists, and mechanics—a total of 44.

ON 37-ACRE PLOT, this 400,000 sq. ft. plant provides efficient processing and handling, ample room for expansion.

Whitman's New Plant

Coordinates Candy Making

Designed for straightline flow of materials, single-story plant features 'floating-slab' construction, advanced air-conditioning and electrical services

COMBINING the latest in functional and attractive design, the new N. Philadelphia plant of Stephen F. Whitman & Son will be a model candy-making facility for many years to come.

The single-story plant is of structural steel, red brick and yellow siding. It's on a well landscaped 37-acre plot that provides parking for some 350 cars and plenty of room for future expansion. Employing nearly 1,600 people, the plant has over 400,000 sq. ft. of space for offices, cafeteria, and manufacturing operations. Except for the office area, the structure is entirely windowless.

Firewall construction nominally divides the plant into five separate buildings, but a skillful layout has integrated production facilities for smooth, straightline flow. Raw materials enter at one end of the plant. Processing, packaging, and storage occur in the center. Finished goods are shipped from the other end. All areas in which formed candy is handled are maintained at 62F. and 50% RH.

Some of the plant's outstanding features:

1. **Use of 'floating' slab and grade-beam** construction, expansion and contraction joints.
2. **Fifteen hundred tons of air conditioning** to maintain precise temperature and humidity control in some 75% of the plant areas.
3. **Electronic dust control** in office areas and ultimately throughout the plant.
4. **Bulk-storage facilities** for 100,000 lb. each of dry and liquid sugars.
5. **Dual-service electrical system** with automatic tie breaker, and battery-powered emergency lighting.
6. **Truck-loading platform** capable of servicing 22 trucks simultaneously, and a rail siding that accommodates five cars.
7. **Latest confectionery equipment,** including complete cocoa-bean roasting and chocolate-blending facilties.

Whitman moved from downtown Philadelphia because both the old plant and its location were no longer suitable for efficient processing and materials handling. Under the best conditions, Whitman's processing and packaging operations are complicated by the large variety of candies produced.

Operations were carried out in four multi-story buildings and a warehouse a few blocks away. Horizontal space limitations made straightline processing difficult and often impossible. Of necessity, materials handling was largely by freight elevator. As production increased, the need to get all operations under a single roof became increasingly obvious.

Outside the plant, traffic congestion severely hampered receipt of raw materials and shipping of finished goods. Moreover, transfer of goods between the plant and warehouse was extremely inconvenient and time-consuming.

The company made its first move by relocating its executive offices in a new building just west of Philadelphia.

For its new plant site, management carefully weighed the pros and cons of relocating in Philadelphia, Suburban Philadelphia, and nearby New Jersey. A prime factor in the company's decision to remain in Philadelphia was the City's cooperation in securing a very desirable tract at a reasonable price. Moreover, a City-created private agency assisted considerably by buying the old plant for redevelopment purposes.

Other factors favoring Philadelphia included the City's active program of redevelopment and highway improvement, plus its excellent public utilities.

The plant was completed last January at a cost of about $4 million. Production started in April.

Construction Features

Exterior brick walls are supported by concrete beams that span exterior column footings. "Floating" floor slabs do not bear on the grade beams, but support them laterally through use of 2-in. vertical dowels and hairpins. Latter

are free to move on the dowels as the slab settles, thus avoiding settling cracks.

Expansion and contraction problems were handled by installation of four complete double-column joints in the steel frame, slip joints every 100 ft. in grade beams, and contraction joints at every exterior column in brick and block work. Interior blocks have vertical contraction joints every 20 ft.

The need for temperature and humidity control in so many of the plant areas dictated a well insulated roof deck and a minimum of glass area. A "U" factor of 0.12 for the roof was obtained by use of Fiberglas on poured-gypsum roof decks. These slabs are individually jacketed in a vapor-proof, kraft-paper covering and set in a continuous mopping of pitch. They are used in all areas except over the kitchens, where concrete channel slabs were chosen because of the high humidity.

Roof vents and hatches over all areas provide smoke relief and access to building interiors. The explosion-proof starch processing and sugar pulverizing rooms have special explosion vents and wall construction.

Plant Services

►**Air Conditioning and Heating**— The 1,500-ton system uses 6,100 ft. of air duct and 1,900 ft. of exhaust ducts. Power required to move 380,000 cfm. of air exceeds 200 hp., and 3,600 gpm. of 36-F. water is circulated to the conditioning units. This water is chemically treated to reduce corrosion and cycled through a cooling tower.

Three water-tube boilers (20 million Btu each) provide low- and high-pressure steam for process equipment and hot-water heating.

To cut air-conditioning and heating costs, Whitman designed the following heat-conserving systems:

1. **Flash tanks handle returns** from kettles and process-heating equipment using 125-psi. steam. For proper operation, back pressure on steam returns from these units should be minimized. However, sending high-pressure returns directly to the feed-water heater, which operates at 5-7 psi., would create back pressure of some 20 psi. Thus, returns are collected and reduced in pressure to 1-2 psi.

Flash steam is sent to a heat exchanger through which are passed returns from a forced hot-water reheat system. Air conditioning requires constant reheat which continually lowers the temperature in the reheat system. This heat demand is partially supplied as return water condenses flash steam. The remainder is provided by a heat exchanger in the boiler room.

2. **Certain process equipment** (cold tables, tempering jackets, etc.) require 55-F. water. It was not practical to use the 34-F. water from the main air conditioning chilled-water generators because they operate in an essentially closed circuit.

To eliminate the need for an individual chilled-water generator, return water from the main spray-type dehumidifier is used as the heat absorber for the process system. The spray-water return system has a temperature of 44F. throughout the year.

►**Electrical Service** — Economy convenience, and continuity of service are prime requirements of the plant's electrical system. To conserve wiring, load centers have been placed where load is generated. A single transformer is used for both lighting and power.

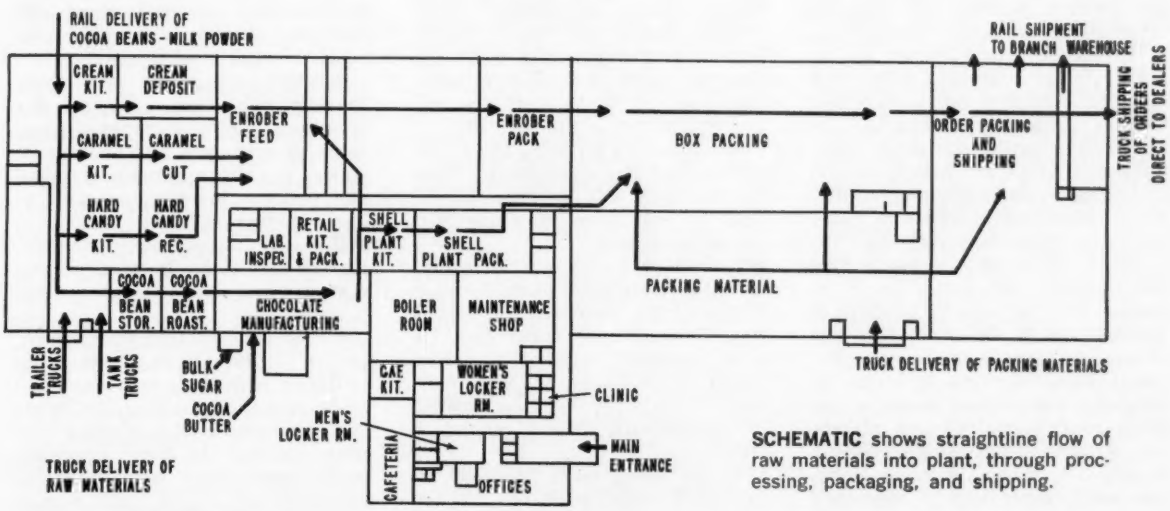
The dual-service system is supplied at 13,200v. which is stepped down to 480/277v. The 277-v. service, used for fluorescent lighting fixtures, reduces the amount of copper required. And it reportedly is less expensive to operate because of a lower power loss associated with the 277-v. ballast.

All large motors have capacitors, and additional corrective capacity will probably be required to achieve the desired 95% power factor.

►**Water is supplied** from either of two pumping stations, and gas is available for optional operation of the oil/gas fired boilers. City sewers accept the plant's sewage, while other refuse is trucked away. Cocoa-bean shells are sold as a byproduct.

►**Fire protection** is provided by a sprinkler system and hydrants around the plant perimeter. To facilitate plant security, an alarm registers on a panel in the guard's office should any door be inadvertently left open.

►**Quality control** is supervised from a well-equipped laboratory, and a large machine shop handles practically any maintenance problem.



SCHEMATIC shows straightline flow of raw materials into plant, through processing, packaging, and shipping.

ATTRACTIVE as well as economical, prefab brewery has huge windows to exhibit gleaming copper brew kettle and colorful bottling machinery. Aluminum canopy shields bottling-area window.

Prefab Slashes Plant Cost

Cuts $250,000 off building expense. Butler pre-engineered components used in small brewery with metal walls and roof

ONLY $1,000,000 was available to build a brewery and buy equipment. More than half of this was earmarked for equipment for the 250-bbl./day plant. More than $500,000 would be needed for the building alone. Dakota Malt & Brewing Co. had a problem.

Rather than reduce the overall size and capacity of the brewery, the owners decided to consider alternate methods of construction. A Bismarck firm (Dakota Building Systems) submitted a bid that sheared $250,000 off earlier estimates. It based its bid on the use of prefabricated building components that permit faster, easier, and more economical construction. These were engineered and made by Butler Manufacturing Co.

Dakota Building Systems became the general contractor. In cooperation with architects Leonard & Askew, A.E.A. of Bismarck, the contractor erected the brewery for about $300,000. This includes insulated steel curtain walls, aluminum roof, electrical and plumbing fixtures, special steel structurals to hold certain heavy brewing equipment, and a two-story brick and tile brewhouse. Construction, except for plumbing and electrical work, took only six months.

Construction Problems

Here are some of the building problems and their solutions:

►**Problem** 1—What to do with bulky brewing equipment. Grain storage tanks are 42 ft. high. Diameter of brewkettle is 12 ft., filtering tanks 18 ft. and fermenting tanks 10 ft. How do you get this equipment in the building?

Solution—By building the brewery around the equipment. When the building was finished, placement of equipment was also virtually completed.

►**P. 2**—How to take up horizontal thrust in rigid steel bents because of building's wide span (244x200 ft.). Conventional transverse tie rods seemed impractical. Bismarck, incidentally, has rigid code requirements for live load because of potentially heavy snowfall. How done?

S.—By using more than 500 reinforcing rods anchored in the foundation wall and projected into the floor slab.

►**P. 3**—How to overcome torque and vibration caused by the operation of brewing equipment.

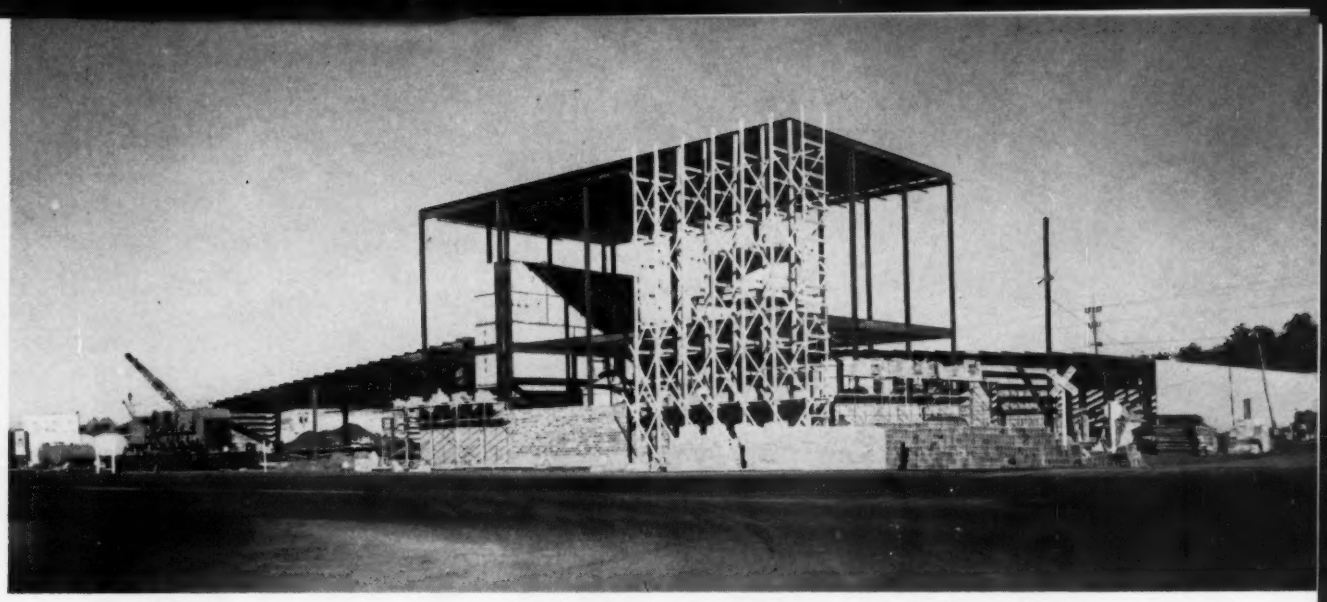
S.—By sinking special footings 6 ft. below grade and making provisions for use of certain oversized steel members, special bracing and connections.

►**P. 4**—How to obtain most efficient use of manpower and equipment through good layout?

S.—By laying out a 1-story brewery operation — except for brewhouse. This eliminates time-delaying elevators and overuse of stairs. Result: minimum material and product handling as well as less supervision.

►**P. 5**—How to get maximum thermal efficiency by keeping refrigerated areas away from outside walls?

S.—By constructing refrigerated rooms (12,000 sq. ft.) within the building, with their own walls and 14-ft. suspended ceiling. Walls are tile, separated by 4-in. thick Fiberglas. Ceiling is 3-in. expanded bead board with hard asbestos board on top (⅛ in.) and bottom



BUILT QUICKLY, structure was erected around pre-installed bulky production equipment. Prefab Butler components were used except in conventionally built brew tower.

(¼ in.). There are a 60-ton air conditioner and two 7½ x 7½ twin cylinder compressors operating at 900 rpm.

Construction Highlights

Notable are these:

. . . **Brewery is primarily** of modern lightweight steel construction. It is a 244-ft. wide building with a continuous double slope from a single-ridge roof. The design avoids internal gutters and internal gutter-drainage plumbing. System provides 20x50 ft. bays supported by slender steel columns. It offers much column-free space at economical cost.

. . . **Walls** are of Butler Monopanl, a pre-engineered, galvanized steel (24 ga.) curtain wall specially designed for fast erection. Panels are factory-insulated with 1¾ in. of 2½-lb. Fiberglas of the non-settling type.

. . . **Panels** are factory shipped in 1-ft. widths, about 3 in. thick. They were factory-sheared to height of brewery walls (14 ft.). They're permanently sealed merely by pushing them together (like tongue-and-grove planks) and fastened to structurals (top and bottom). A double vinyl seal (under pressure when panels are pushed together) forms positive moisture and thermal barriers between inner and outer faces. There are no unsightly external fasteners, no visible external fasteners, no visible external joints, and no caulking.

. . . **Panel** exteriors are box-fluted, interior face is flat. External brewery walls are tan-finished and the interior is cream. Both are factory-applied plastic finishes that meet highest specifications for adherence, uniformity, scuff-resistance, and durability.

. . . **Roof** is made of Butler aluminum roof panels with white plastic finish, installed on top of 2-in. Fiberglas blanket insulation. Panels, (3x32 ft.) are precision roll-formed, factory punched and sheared. The one-piece roof ridge panel is precision die-formed to match exactly with adjoining panels. This eliminates rusting and maintenance where ridge roll flashing closes the ridge.

. . . **Panels were coated** with non-hardening weather compound before installation. Under pressure, this compound permanently seals all joints water-tight. Roof panels were fastened with a special tool that doesn't shear free of fastener until reaching 1,400 psi. Avoided, this way, were human errors in tightening each fastener. Top of fastener seals the hole with a lifetime, flexible neoprene gasket.

Butler engineers say the metal roof gives the protection of a one piece metal shell. Yet it is designed with the necessary give-and-take to compensate for expansion and contraction due to temperature changes. It should be almost maintenance-free for years to come.

. . . **Installed in roof** over warehouse area (about 100x200 ft.) are 22 translucent plastic skylights (3x8 ft.). They have the same configuration as adjoining metal roof panels, are installed the same way. They provide natural illumination for warehouse interior.

. . . **A vertical showcase window** (30x24 ft.) displays the glistening copper brewing kettle, its impressive piping and associated equipment. A horizontal window area—about 80 ft. across the front—exhibits bottling machines, color-dynamically painted in bright orange, white, yellow, and red. A butterfly canopy of corrugated aluminum (0.052 ga.) extends across the horizontal window area.

. . . **The brewery floor** is of 6-in. reinforced concrete gravel fill. Office area, 14x40 ft., has a wooden sub-floor with vinyl tile.

. . . **Transformer room** is a 10x12-ft. explosion-proof vault, within building itself. It has concrete walls, faced with brick, and 6-in. concrete roof.

. . . **Two shipping docks** serve the brewery. Each is 8x40 ft. and sufficient to load or unload ten semi-trailers in an 8-hr. shift. There are facilities for five freight cars on a siding in front of the building. Three cars can be loaded or unloaded in a day. Barley, malt, grits and hops are handled by automatic weighing machines and augers.

. . . **Brewhouse,** conventionally constructed, is 44 ft. tall and measures 50x80 ft. Its exterior is Hebron brick; interior facing, clay tile.

ATTRACTIVE overall appearance make Hiland a good neighbor in a fast-growing residential and industrial area.

Designed for Expansion

Suburban setting for new Hiland Potato Chip plant eliminates former problems caused by city congestion. But more than that, it's built with a booming future in mind

WHAT DOES a company do when it has cramped space, poor transportation connections, inefficient materials handling, a tangled plant layout, insufficient production capacity, inadequate parking space, and diminished water and electrical facilities?

Hiland Potato Chip Co. answered these problems by constructing a million-dollar plant 2½ miles northeast of its former location in downtown Des Moines, Ia. New facilities not only solve previous drawbacks, but make sure they won't occur again for a long time. In almost every section of the Hiland plant, expansion potential is an integral part of the design.

New structure is spacious, occupying 70,000 sq. ft. on a well-landscaped 10-acre plot, compared to the old 17,000-sq. ft. plant and 28,000-sq. ft. warehouse in the city. People and materials can move easily to and from this single-story structure. It's orderly, well-lighted, and a model of clean efficiency. And it utilizes the best of modern equipment as well.

Outside appearance is attractive. Handsome front comprises two separate, yet harmoniously blended facings — one for offices and cafeteria and the other for production. A stepped-in roof effect provides extra ceiling height to processing areas and less to offices and garage.

Office and cafeteria design has spacious aluminum-framed windows with buff-colored brick and decorative, corrugated aluminum panels stretched from windows to roof line. Production section facing is of tilt-up concrete slabs, sprinkled with rose quartz and black stone and mounted on top of brick 2 ft. high. These slabs along the north wall portion of potato storing and peeling areas can be pulled out and raised, providing the expansion key needed. Foundation is already in and steel has been pierced.

Plenty of Space

Plant is generously set back from the road, with enough space provided for lawn, trees and shrubs. Minimum-care plants are used to keep maintenance down.

With abundant land surrounding the plant, Hiland eliminated parking problems. Black-topped lot is expected to keep pace with growth, yet no one will have a long walk from car to plant.

Staff personnel have private carpeted offices with interiors decorated to individual color schemes. Conference room is attractive but practical with soft lights and green carpeting. Consolidated office is designed for beauty, quiet and efficiency. Colors are white and pastel green to blend in with lobby and reception area. Grey glass is used to reduce glare problems. And offices can be readily expanded by removing a wall and taking up cafeteria space that can be tacked on elsewhere.

Cold window problem is solved by full-length thermopane and air control. Perimeter heating along outside walls eliminates window steaming and minimizes dirt pick-up on walls.

Modern cafeteria serves 80 in a restful color scheme complemented with piped music. Metal sound-absorbing ceiling is easy to clean.

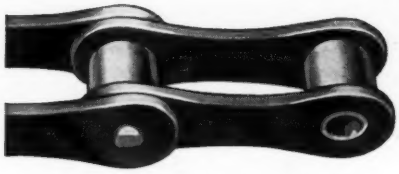
A plant-long hallway (6x625 ft.) separates processing from non-processing areas. Significant is that it "curtains" noise from

(Turn to page 73)

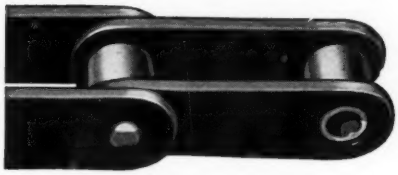
SINGLE STRAND

DOUBLE STRAND

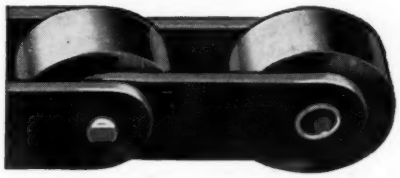
SINGLE STRAND, HEAVY SERIES



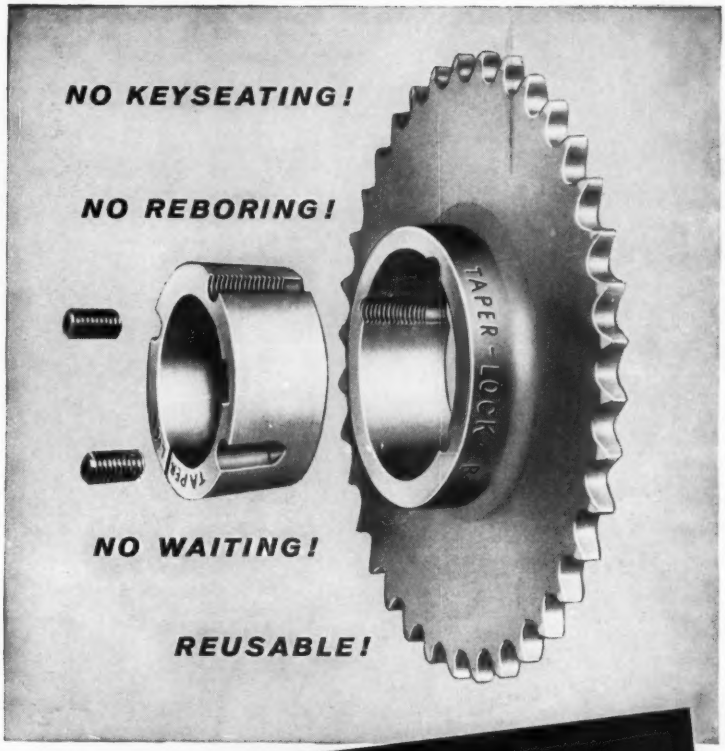
DOUBLE PITCH TRANSMISSION



DOUBLE PITCH CONVEYOR



DOUBLE PITCH CONVEYOR, LARGE ROLLERS



TAPER-LOCK SPROCKETS DODGE ROLLER CHAIN

DODGE Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

DODGE
of Mishawaka, Ind.

IF YOU MAKE THESE PRODUCTS:

dry mixes, cookies, crackers, cakes, pies, soups, sauces, gravies, frozen pies, ice cream, sherbet, confections, macaroni & cheese—or most any product calling for non-fat dairy solids . . .

KRAFEN

(Kraft's spray-dried sweet whey)

WILL GIVE YOU THESE BENEFITS

Fine, True Flavor—Krafen's high milk sugar content and absence of casein works to bring out the natural flavor of all processed foods, frozen foods, ice cream, sherbets and baked goods—the flavor other dairy ingredients tend to mask!

For example, frozen food processors using Krafen no longer need "over-season" to maintain the flavor level.

Improved Eating Quality and Appearance—Krafen's combination of milk sugar and whey proteins gives added shortness and tenderness to all finished baked goods, whether ready-baked or from a mix . . . imparts finer texture and promotes a uniform, rich color and bloom.

Extended Shelf Life—Krafen's high moisture absorption and retention properties extend the shelf life of baked goods by a profitable margin.

Savings of up to 5¢ a Pound—Replace your present dairy ingredient with Krafen. Save up to 5¢ a pound on dairy solids costs and be assured of superior performance. Krafen—a high-quality, low-bacteria, low-acid dairy ingredient—is produced by Kraft in one of the world's largest, most sanitary whey plants.

Ask your Kraft man or write to Kraft for a free sample of Krafen and complete data on its use in your products. Then test Krafen in your plant and look forward to great results!

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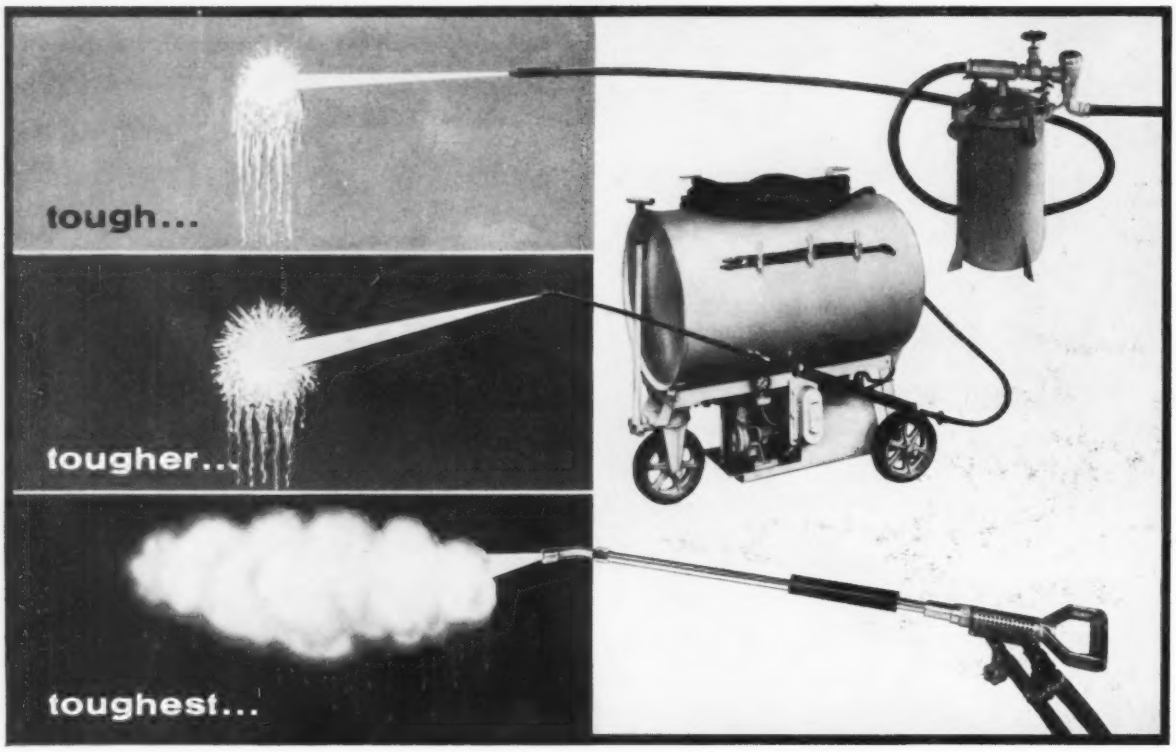
The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



soils removed faster, easier, at less cost with Oakite Mechanized Sanitation methods

No matter how tough a cleaning chore may be, there's an Oakite mechanized unit to cut the job down to size —and cut its cost, too. By making hard jobs easy, mechanization saves cleaning time—and money. Got a difficult job? See how the Oakite Saniseptor simplifies it. Got one more difficult? Oakite's Hot-Spray Unit will get through it fast. Toughest of all? The Oakite Hurriclean Steam Detergent Gun will blast it off the quickest. Check descriptions below. Then ask the Oakite man to demonstrate.

1. **Oakite SANISEPTOR** operates off your own hot water line. Merely open a valve to cover surfaces with a jet stream of cleaning-sanitizing solution. Then adjust a valve to rinse. The Saniseptor is particularly useful for light housekeeping chores.

2. **Oakite HOT-SPRAY UNIT** for heavy duty work jets a pressurized spray of hot cleaning solution onto equipment, floors, walls. Rolls through the plant carrying the cleaning solution with it. Cleans up to 12,000 sq. ft. in ½ hour.

3. **Oakite HURRICLEAN STEAM DETERGENT GUN** combines force and heat of steam with chemical action of modern detergents to remove heaviest soils in seconds. Light, cool, convenient. Swivel-action nozzle directs solution from above or below with just a twist.

The Big PLUS in Oakite

With every pound of Oakite material you get Big Plus benefits that cut cleaning costs: personal service; unmatched experience; results of latest research; materials and methods guaranteed to perform. Send for Bulletin F-9414 on mechanized cleaning. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE

over 50 Est. 1909 SCIENCE years' leadership in industrial cleaning

← CIRCLE 71 ON INQUIRY CARD

CIRCLE 72 ON INQUIRY CARD

processing, serves as a good emergency escape area, and is lined with plenty of windows that allow visitors to observe entire processing operations without disrupting production.

Inside bays are wide, high and well-lighted. In most cases, equipment covers less than half the floor space—providing room for additional production lines. Aisles are wide, especially in raw potato storage and peeling areas, for safe and easy forktruck driving even with heavy, bulky loads.

Straightline mass production techniques are dominant. Automatic potato washing, peeling, slicing, frying and packaging is carried out on two pushbutton synchronized lines. Actually, operations are laid out along a U-shaped path. Raw and finished storage make up the U's sides and processing is along the bottom.

Output has jumped from old plant's 8,000 lb. of chips per day to 12,000. Hiland expects to top 20,000 lb. with existing facilities. And even bigger volume will come via added lines already planned.

Layout Features

Aside from the offices (39x92 ft.), cafeteria (30x39 ft.), and garage (22x144 ft.), plant is divided into seven general areas:

. . . **Raw potato storage** (92x120 ft.) Ceiling is 25 ft. high with 16-ft. supporting stresses for stacking potatoes. Room holds 5½ million lb. (183 carloads) of product. Unsurfaced floor is 7-in. reinforced concrete over clay fill. Outside walls are 8-in. tilt-up concrete slabs painted on both sides.

Temperature-controlled air (50F.) is blower-circulated via elaborate duct system every 3 min. with ¼ fresh air content. Whenever respiring spuds elevate temperature above 50F., heated air circulation is automatically cut off and cooler outside air is introduced. Space heaters are directed at door openings (two for semis and two for RR cars) to keep out cold air. All doors are electrically opened and closed.

Standout feature of storage area construction is its flexibility geared to maximum space use. For example, there are fewer potatoes held in raw storage during summer than winter months. Opposite is true for finished stock. So, by opening any of five doors, which serve as walls between raw and finished storage, one room can take the overflow from the other.

. . . **Curing** (26x105 ft.) Area holds 600,000 lb. of potatoes at 100F. and 100%RH when required. It's equipped with three ceiling-suspended humidifiers and a hot air recirculating system. Walls are painted cinder block. Supporting steel structure is painted aluminum to prevent rusting.

. . . **Washing and peeling** (37x80 ft.) Floors are 7-in. concrete with worked-in red color. Sides have tilt-up slabs and cinder block. Drains are floor trenched and covered with removable steel grating.

. . . **Fryer** (80x83 ft.) Floor base is also reinforced concrete with red, anti-slip quarry tile. Walls are cream tile up to enamel-coated suspended ceiling (13 ft. high).

Control panel's selector-switch indicates and controls speeds of five drive shafts from peeled spud hopper to salter. Two remotely located shortening-heating ovens (in boiler room) are monitored from here by closed-circuit TV.

. . . **Packaging** (48½x96 ft.) Air-conditioned room's floors, walls, and ceiling are of same construction as fryer room. Present equipment includes two rows of six weighing-filling machines and there's space for six additional packaging units.

. . . **Finished goods warehouse** (120x128 ft.) Area features fully conveyorized Rapids - Standard "live storage" and order-picking equipment. Conveyor case capacity is 6,550 plus 4,000 in pallet storage.

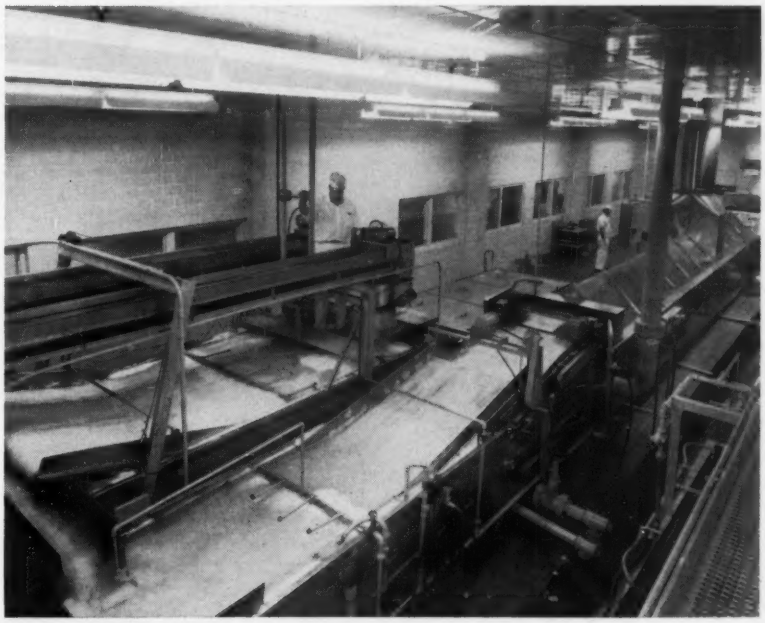
Chips are shipped throughout Iowa by Hiland semis to firm's local delivery truck points and delivered fresh to retail stores within 24 hr. of manufacture.

. . . **Boiler** (39x80 ft.) Incoming electrical supply to main distributing panel (600 amp., 480v., 3 phase) is fed throughout plant at 440v., then stepped down to 110 or 220v. where needed. All motors run on 440v.

There are three 15-hp. air compressors, used mostly for packaging machines, with one employed as a standby. Also included is a 36 hp. refrigeration unit to air-condition offices and cafeteria, plus three 10-ton units for packaging rooms.

Incoming gas (100 psi.) is reduced to 9 psi. It's fed through an 8-in. pipeline to a header, then bled off into six 3-in. lines for fryers, hot water, cafeteria, etc. A gas-fired, high-temperature boiler supplies hot water to heat the plant.

Room's complete machine shop is equipped with lathe, drill press and roller and welding facilities.



STRAIGHTLINE production moves efficiently through well-lighted and sanitary bays. Windows along hall (right center) separate production from office activity.

FOCAL POINT of processing department is the centrally located mixing area, conveniently flanked by grinding, blending and raw material storage.

Small Plant Boasts Space Economy

Forced to do something with its old plant or build a new one, midwest spice firm undertook the latter course. Venture paid off

HERE'S A UNIQUE SMALL PLANT that's just under 25,000 sq. ft. and nested on an acre plot. But because it's small, and because of the nature of its products (spices, spice and soluble spice combinations, dry soup bases, dressings, liquid tenderizers, emulsifiers, etc.), Milwaukee Spice Mills just doesn't need "everything" that would distinguish a much larger plant. When judged in relation to its size and products, MSM has everything it needs—in abundance.

A simple layout provides flexibility and expandibility, plus a smooth, efficient materials handling system housed in a rectangular-shaped building of one story construction. Wide expanses assure easy flow of materials and personnel. Quality control is located in the mezzanine for easy spotting (through large picture window) of equipment in use. Raw materials storage is tremendously simplified, almost completely mechanized.

Smooth Process Flow

General layout of production area (along west side of building's interior) creates five separate manufacturing operations:

1. **Grinding and classifying** of natural spices in roller, impact and attrition mills, and air classifiers. These operations—actually the start of production—are located in the north end of the building.

2. **Mixing**, heart of the production area, is located in the center west-side area of process flow. Here, compounded in ribbon-type mixers, are combinations of ground natural spices, natural and soluble spices, emulsifiers (phosphates and sodium caseinate), FDA-approved food ingredients (sorbic and ascorbic acids, MSG, curing agents, etc.), and dry soup bases.

3. **Blending (mulling)** in similar mixers. Produced here are soluble spices—spice oils and extractives blended with salt and sugar carriers. Adjacent to blending is a special room where spice oils and oleoresins are accurately measured.

4. **Preparation** of sauces, dressings, and liquid tenderizers in beater-type mixers.

5. **Packaging** portion-controlled amounts (½ to 5 lb.) in saran-coated paper bags that are packed into fibreboard drums. Employed are single-spout weigher-fillers (Triangle and Exact Weight).

Because mixing is the major production area, grinding and blending were laid out on either side to feed into it. Layout assures MSM greater production flexibility. It can transfer products from blending area either directly to packaging or to mixing.

Building upkeep is reduced to a minimum by careful selection of the most modern construction materials. Floor is pitched to a drain under each machine, and a steam outlet, near each machine, facilitates cleaning operations. This, in itself is a job-saver, inasmuch as an average of ten different spice blends are made up every day in each unit. And this calls for as many steam cleanings.

Other Plant Highlights

Company's average 200,000 monthly "raw" tonnage is pallet stored in an area extending through center of new plant. Pallet stacked raw materials (in bags or drums) are in selected areas near processing equipment.

Ingredients are weighed on portable scales, rolled between specific storage and processing areas. This abolishes former congested, long-distance hauling of weighed ingredients from old plant's single floor-mounted scale.

Lab facilities, tripled in size on the mezzanine, overlook entire processing line. Set up is specifically designed for production scheduling. Technical director schedules orders according to availability of equipment. In this manner he's able to advise customers when shipments will be made by simply looking through picture window and estimating production timing.

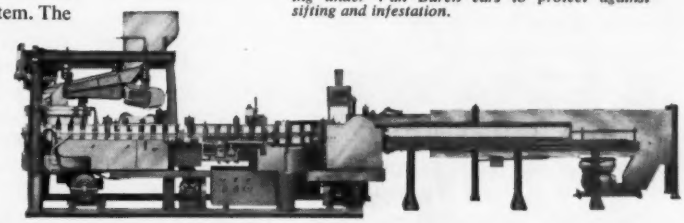
(Report continued on page 77)

Pillsbury gets top packaging speed with single-wall cartons and FMC Neverstops

Pancake mix, instant hashed and mashed potatoes, angel food cake mixes. All these Pillsbury products are adequately protected in a single-wall carton and automatically filled and sealed on modern FMC Neverstops. One- to three-pound packages are handled at production speeds from 180 to 300/minute . . . three times faster than any carton-innerliner arrangement. Cartons are glassine-laminated and Calk-Sealed* under Van Buren ears. Most are compartmented to include two and three different items (filled simultaneously) or separate servings of the same item.

Today more products than ever can be accurately filled on a high-speed Neverstop. Pillsbury's varied product mix proves it. The instant potatoes are handled by the exclusive FMC Vibrametric system, the pancake mix by an auger system. The Neverstop packaging angel food cake mixes has a multiple filling head, with one auger handling prepared flour, another auger handling egg white and a volumetric system adding chocolate chips. In whatever capacity, the Neverstop automatically opens cartons from a magazine supply, then code dates, bottom seals, fills, top seals and delivers them under the supervision of a single attendant. Six models offer a wide choice of speeds (up to 400 per minute), capacities (up to 10 lbs.) and carton sizes (up to 11 x 5 x 15½"). Optional equipment includes automatic check-weighing of each carton with feedback to volumetric control . . . and high-speed Calk-Sealing for greater product protection. FMC also offers a complete line of both automatic and semi-automatic auger fillers for medium and short runs.

**Trademark of Packaging Corporation of America for a specially developed, hot-applied caulking under Van Buren ears to protect against sifting and infestation.*



Perhaps you can double or triple the speed of your carton filling line with single-wall cartons and an FMC Neverstop. Write for a copy of Bulletin P-808.

FMC CORPORATION
PACKAGING MACHINERY DIVISION
Stokes & Smith Plant: 4914 Summerdale Avenue, Philadelphia 24, Pa.

PURE VANILLA

It is probable that more money is spent in the food industry for vanilla extract than for any other flavoring ingredient. In the dairy industry vanilla ice cream alone accounts for 60% of all ice cream sales. Figures for the baking industry indicate that vanilla equals or exceeds all other flavorings in volume. Other food industries use comparable amounts.

Altogether, more than $10-million is spent annually for vanilla flavor. It would be a logical assumption that purchasers responsible for spending this huge sum should not easily be misled. Unfortunately there exists, even among some of the most experienced buyers, incredible misunderstanding and confusion about the variations in price among sources of supply, about prices from season to season and, in spite of the gyrations of the vanilla bean market, how some "pure" vanilla products can be offered at prices below reasonable cost of ingredients.

Many vanilla buyers have tried to apply reason to this perplexing, even chaotic, situation through careful development of specifications based on traditional analytical values: lead number, resins and vanillin. **But these three factors represent only one facet of this analytical approach** and can be disappointingly misleading. Some of the most experienced technicians frequently obtain widely varying analyses from the same extract!

Here is **the second facet** not to be overlooked in the determination of vanilla quality: there are many plant extractives and synthetic flavoring materials which can be used wholly, or in part, to produce the same analytical values, and to simulate the taste, of true vanilla. Fortunately this need no longer present a problem to the vanilla user who wants to be absolutely sure of what he is buying.

NOW there are methods which positively establish whether a vanilla flavor is a pure product made ONLY from vanilla beans.

These methods have been developed and perfected during six years of cooperative research financed at considerable cost, shared by the Vanilla Extract Manufacturers and the Vanilla Bean Association.

In addition to improved conventional analytical procedures, there are now such revolutionary techniques as paper chromatography, gas liquid chromatography, and other scientific methods. The above methods in whole or part will lead to standardized procedures for the analysis of pure vanillas.

There has always been, and always will be, a difference in pure vanilla extracts, because progressive manufacturers diligently work to maintain the highest standards in their purchases of raw materials, in storage of their vanilla beans, and in the processing and production of their extracts.

Vanilla users striving to produce the finest products to win a larger volume in today's competitive market can now learn more of the real value of the vanilla extracts offered them. In addition to investigating the integrity of their supplier, the newly developed methods of quality determination provide more positive assurance that the extracts they buy will have the full flavor profile of fine, pure vanilla.

Analytical proof may now be obtained from a number of qualified independent consulting laboratories.

KNOW YOUR VANILLA AND YOUR SUPPLIER

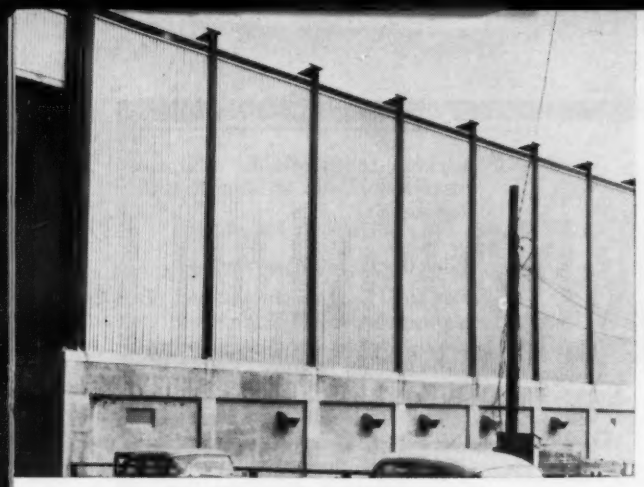
Warner Jenkinson manufacturing company

RED SEAL — WARNER-JENKINSON MFG. CO. — TRADE MARK — ST. LOUIS

Manufacturers of Certified Food Colors, Vanillas, Extracts, Flavors

HOME OFFICE & FACTORY: 2526 Baldwin Street, Saint Louis 6, Mo.
LOS ANGELES FACTORY: 2515 Southwest Drive, Los Angeles 43, Calif.

Warehouses in principal cities



GENERAL MILLS plant has metal walls, inside and out.

New Mill Has Metal Walls

GM plant built for show, low maintenance, sanitation

UNLIMITED service life with little care. That is why exterior walls are of stainless steel. That, plus the striking appearance and color uniformity of the showplace factory. We refer to the architecturally advanced new Bellera Mill of General Mills, Inc., at Buffalo, N. Y.

These walls were easily and quickly assembled from 12-in. wide units. These are double-ribbed and have integral 1½-in. stiffening ribs 6-in. on centers. The ridges do more than provide rigidity. They control light reflection and provide continual drainage.

The steel is 20 gage, Type 302, with a No. 2B finish. One edge of each 40-ft. long panel has a male rib. The other has a female rib to provide interlocking joints. Panels are connected to standard girt framing with concealed fasteners. All closures and fasteners are also 302 stainless.

The facade of the mill is divided into bays by 14-in. painted-steel columns set 18 ft. apart.

Crevice-Free Inside Walls

Interior walls are crevice-free—an important feature in any food plant. The walls are galvanized steel panels with 1½ in. of insulation. They are separated from the exterior stainless walls by a 7-in. air space, itself an insulator.

Bellera is 125x135 ft. Standing 40 ft. high, its steel frame is supported by a 15-ft. reinforced concrete frame carried to rock by steel piles.

The structural frame is designed to be stable without dependence on exterior columns. Roof girders are 36-in. wide flange sections weighing 230 lb. per foot and 135 ft. long. Two rows of interior columns support these girders. Approximately 35 ft. of cantilever projects from each interior column center line. The dead load of the 6 in. concrete roof slab was carried on the bottom flange of the girders and applied while they were in a cantilever state to obtain proper roof slope.

This design afforded a finished concrete ceiling with no projecting structural roof framing members. The entire roof slab was poured in one day to uniform deflection of cantilevered sections.

Continuous electric heating cable is connected to girder webs at the junction with roof slab to prevent condensation.

The smooth interior walls and the relatively uninterrupted ceiling are considered big aids to sanitation.

SS for Instant Plant, Too

Another outstanding new food factory has an exterior sheathing of stainless steel. It is the $1-million-plus instant potato plant of Salada-Shirriff-Horsey, Ltd., at Alliston, Ontario.

Management believed that the outside of this big plant should look as clean and sanitary as the inside really is. The architects, therefore, specified a windowless stainless steel curtain wall for the entire building. This is above a 7-ft.-high base wall of brick that adds color and variety to the architecture.

Gerber Designs to Meet 1970 Needs

Puts new factory in Southeast to cut shipping costs

BUILT to serve the Southeast, Gerber's new baby food plant in Ashville, N. C., was carefully planned for expansion.

After 10 or 15 tries, a plant layout was developed that satisfied production and engineering requirements to about 1970. Then year-by-year layouts were made to show proposed additions each year to handle more products and increase production capacity.

Purpose in starting with future final layout was to put machinery in its permanent location initially. This avoids the cost and disruption of moving equipment each year as the plant expands.

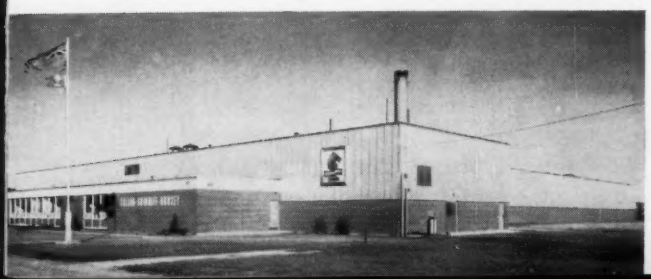
There's another big benefit, too. Knowing the eventual setup enabled the engineers to do a good job in sizing and locating main utility service lines.

Here are building features: The plant has a wide area of attractive acid-proof floor laid in acid-resisting mortar for lifetime service.

Walls are faced with light green ceramic tile 8-ft. up from the floor. There is a white tile-like paint finish from there to the ceiling. Sanitation, easy cleaning, low maintenance, and attractiveness are achieved.

No walls separate departments in the factory. So there is a feeling of spaciousness. There is flexibility of movement and equipment placement, too.

The 120,000-sq. ft. plant is served by a 115,000-sq.ft. warehouse.



SALADA - SHIRRIFF - HORSEY builds with stainless walls, too.

VAHLSING quickly puts foamed plastic on prefab frame.

Foamed Plastic Makes It Easy

Quickly installed as low-temp room insulation

INSULATED freezer rooms are built with amazing facility and performance certainty with today's materials and techniques. Consider two examples.

Slabs of lightweight, moisture-proof, rodent-proof, rigid foamed plastic simplified the erection of a new 120x160-ft. freezer building by Vahlsing, Inc., Easton, Me. With temperatures down to 15 deg. below zero, two layers of 3-in. insulation were required.

To install the foamed plastic, the builder devised a quick, efficient way of fastening the two Styrofoam layers to a quickly erected pre-engineered Butler framework.

The first layer went up vertically in 9-ft. boards, temporarily fastened to framework Z-bars with jute twine. The second layer was installed with mortar and laid up horizontally. It was secured with 3-in. channels and bolted through to the girt with ½-in. plastic bolts. The latter do not transmit heat through the insulation. They avoid condensation and corrosion by the formation of cold spots on the exterior facing.

Interior finish of the insulation was a layer of mastic emulsion, a layer of Glasfab cloth embedded in the emulsion, then another layer of mastic emulsion painted with a coat of asphalt paint. The whole outside surface was covered with a polyethylene sheet and bonded with mastic. Then quick-up prefab Butler metal panels were installed.

Two layers of foamed plastic insulate roof and floor. Floor insulation is installed between concrete sub slab and concrete wearing slab. Under all load-bearing columns in floor area are two layers of 3-in. high-density, load-bearing Styrofoam HD 2.

The light weight of the foamed plastic (less than 5 lb. for a slab 3x16x108 in.) enabled construction workers to handle it with ease. Installation was on almost a production-line basis.

Tuna Packers Likewise

It took 8-in. of the foamed plastic insulation for the new zero tuna storage room of Breast-O-Chicken, in sunny San Diego, Calif.

The thickness was achieved by staggered layers of the material—3-in., 2-in., another 3-in. Before the insulation was installed, all surfaces were coated with asphalt primer and hot asphalt. Then a rough coat of cement plaster was applied, this later being covered by a smooth finish coat.

The Styrofoam installation was handled by an Approved Insulation Contractor under a nationwide quality control program established by Dow Chemical Co. Dow accepts the responsibility in case of failure in one year due to faulty manufacture. The contractor accepts it if he failed to follow installation specs or permitted poor workmanship.

Meat Plant That's Different

Unusual architecture has functional values

NO OTHER food plant is designed quite like it. Look at it from the side and you see four slant-roof windowless buildings with ribbed metal walls. These are connected by brick-wall panels with windows high up. All are atop conventional ground-floor walls and back of an office section of conventional construction.

This is the new $2,000,000 cattle and sheep killing plant of Greeley-Capitol Pack, Inc., Greeley, Colo.

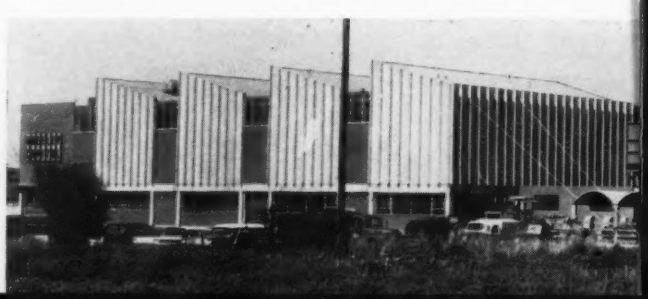
The layout of the plant capitalizes upon gravity. Kill rooms are on the second floor. They extend across front and rear of the plant. A mezzanine at one corner of the second floor is part of the inedible fat rendering department.

On the first floor—fed by stainless gravity chutes direct from the kill area—are the offal room, edible rendering, hide cellar, and inedible rendering.

Ramps at one end of the building give equal access up to the second level or into the hide cellar at ground level. This permits direct drive-in and pick-up. The plant also has an 8-car RR spur.

Strong natural daylighting comes into the plant through 90% glass walls projecting above the basic roof line in front of each of the four sections of the building. Artificial illumination of 70 fc. is also provided by fluorescents—for gloomy days and late shifts.

Kill rooms are sanitarily lined with ceramic tile 18 ft. above the floor. Capacity of the 90,000-sq. ft. plant is 700 beef and 3,000 sheep per day.

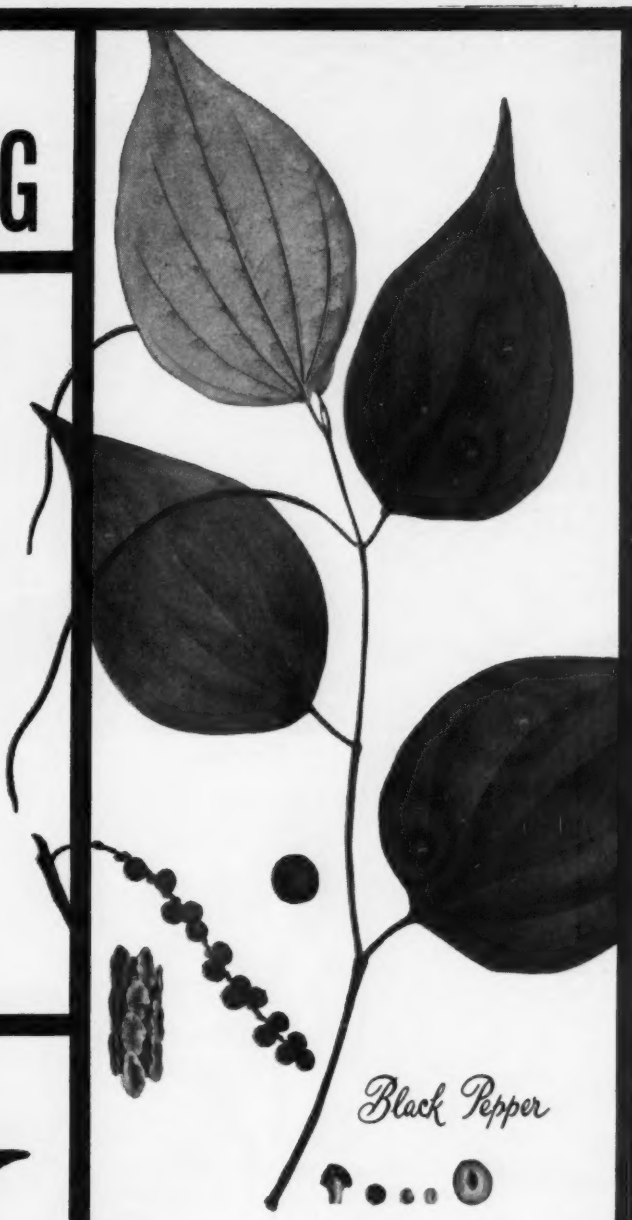


GREELEY - CAPITOL meat plant is different, but functional.

FREEZE DRYING

D&O offers SPISOSEAL the latest development in seasonings for foods of the future. SPISOSEALS are extractions of natural spices, spray dried for absolute flavor stability and unsurpassable shelf life. Full, instant release of flavor, aroma and strength . . . highly recommended for freeze dried foods. Write the D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J., for detailed information.

Write for copy of Spisoseal booklet



DODGE & OLCOTT, INC

MANHATTAN INDUSTRIAL CENTER

SEVENTY-FIVE 9TH AVE. NEW YORK 11, N. Y.

SALES OFFICES IN PRINCIPAL CITIES OUR 162ND YEAR OF SERVICE

D&O ESTABLISHED 1798

FLAVOR BASES
ESSENTIAL OILS
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DRY FLAVORINGS
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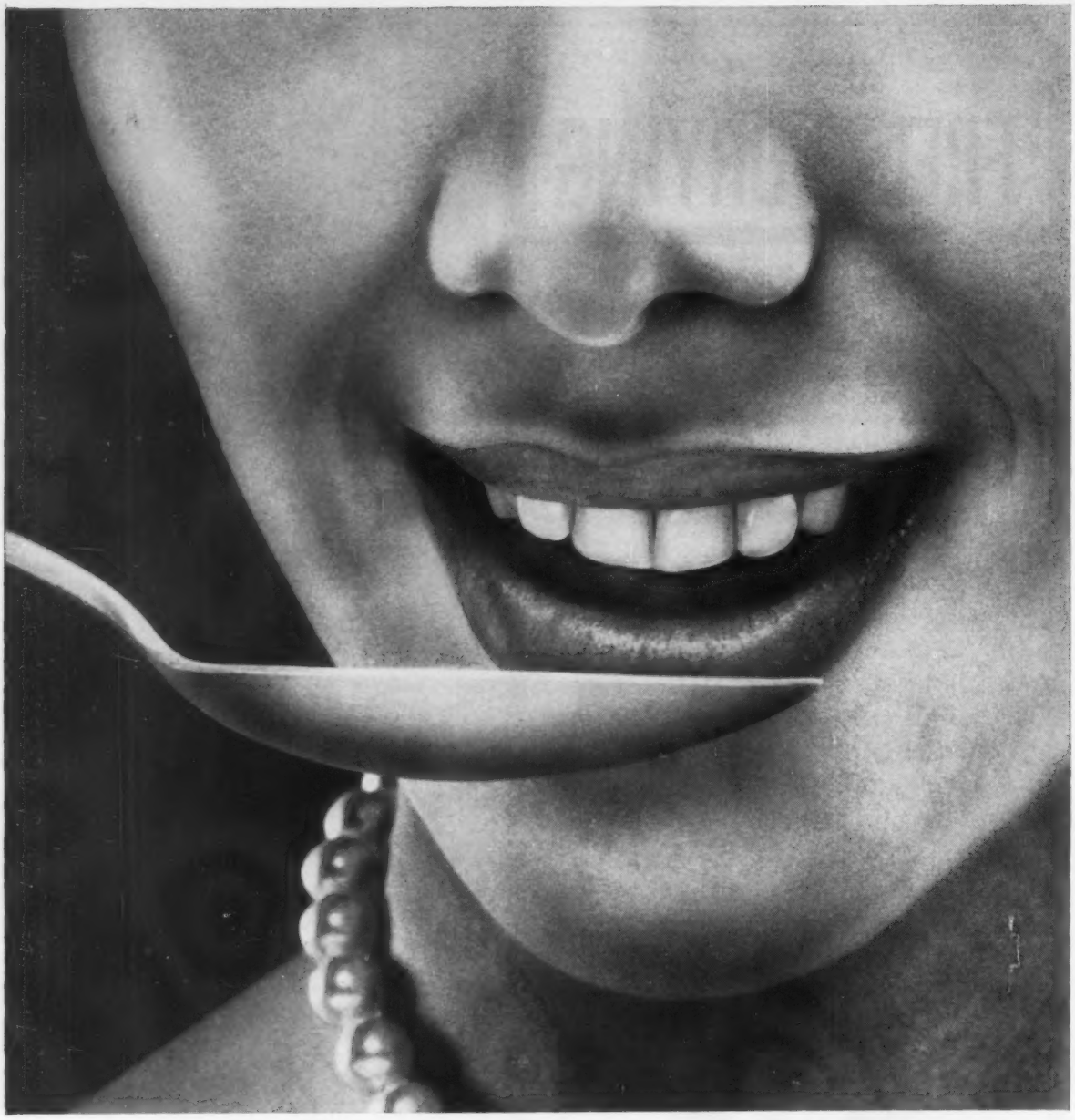

IMPROVE FLAVOR AT RETORT TEMPERATURES WITH STABILIZED HVP-PROZATE

If you process meats, soups or other canned goods that are subjected to high retort temperatures, look to HVP-Prozate for heat-stable flavor.

Prozate® is a hydrolyzed vegetable protein flavoring agent that has been specially stabilized to withstand high temperatures. It is derived from plant protein and imparts either a rich, meaty flavor or a pleasant background flavor, depending on concentration. Prozate is easy to use, can be quickly incorporated into your present formula, and a little goes a long way.

In addition to HVP-Prozate, Hercules offers a full line of other HVP® products tailored to meet the specialized needs of the food industry. For details about Prozate and a sample of it—or for technical help—write to Hercules.

HERCULES POWDER COMPANY
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CH61-2

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Marketing Signals

Another forward step . . .

Backs out of cook-ins . . .

Shift in buying pattern

Custom-Made Freeze Drieds

Freez-Dri Products, Los Angeles, kicked off this month what may be the forerunner of a new industry segment. After 3 yrs. of R&D work, firm opened a plant, with equipment of its own design, for contract packing of freeze-dried foods.

Pres. S. Castorina told FOOD Engineering **a dehydration charge of 10¢/lb., wet weight, includes labor for bulk packaging but not material or containers.** Volume rates will be negotiated, he added, depending on commodity and quantity. Plant capacity: 6,000 lb. of wet products a day.

According to Western Packing News Service, Lipton and Armour have already placed orders.

Plant Expansion in Europe

Food-beverage firms built 53 plants in Western Europe in the Jan. '59-June '61 period, according to an analysis by Chase Manhattan Bank of N. Y. C. Most Favored countries: West Germany, 10 installations; United Kingdom, 9; France, 8; and Switzerland, 7.

Almost half, or 48%, of the plants represented joint ventures with European partners, 40% were wholly-owned U. S. subsidiaries, and 12% were licensed operations. Among the 14 industries covered by the poll, food ranked 7th in new plants.

Set-Back for Boil-Bags

Up and down fortunes of boil-in-bag field suffered a reverse when Lever Bros. disclosed it is dropping its Dinner Redy line of cook-in-pouch entrees for "a modified line of convenience foods." Despite this, a leading supplier still feels that boil-in-bags are headed for boom times. **Du Pont, in a recent survey, predicted that volume would reach 500 million units in '65 as against an estimated 100 million sold last year.**

Price Preference in Basic Shift

Changing buying patterns suggest that food items in the middle-price range are losing out to premium and low-cost versions. So observes Curtis C. Rogers, vice pres. of Market Research Corp. of America.

In the margarine field 5 yrs. ago, he says, low price brands did 40% of the business, intermediates 60%. Today, intermediates have shrunk to 41% while low price entries have increased to 44% and newer premium versions have grabbed 15% of the market. Over in cake mixes, middle-price items lost 8% of their market share the past year, while premium specialties picked up 5% and price-and-deal entries gained 3%.

Trends in Meat Buying

Most supermarket operators feel that ordering fresh meats to specification will increase at the expense of government (too insufficient) and packer (unreliable) grading. Prediction was made by Don Parlsons, executive director of Super Market Institute, at last month's AMI convention.

A poll of SMI members, he added, also showed that: (1) A majority feel there will be more emphasis on retailer's brand in fresh beef merchandising except where packer offers consumer a finished unit package. (2) Economic conditions will accelerate shift to central prepackaging of fresh cuts once needed technological improvements come about.

BRIEFS

Campbell Soups foresees a $25-million volume for its dry soup mixes in 2-4 yrs., company spokesman told Merrill Lynch, Pierce, Fenner & Smith.

Higher earnings are ahead for packaged food companies this year as well as first part of '62, predicts Standard & Poor's in its latest "Industry Survey" report.

Some 35 new products were trotted out by Pillsbury in a recent 12-mos. period, Pres. Paul Gerot disclosed at firm's annual meeting.

Gerber's share of baby food market now exceeds 50%, Pres. Dan Gerber reports. Since '52, he adds, company increased its business 73% while baby food market grew 39%.

TV billings of food and grocery products in the first half of this year, up 8.3% over year-ago levels, reached $156.8 million.

USDA brochure on family food stockpile for survival suggests that each household unit keep a 2-week supply of regular food on hand or maintain a special 2-week reserve of survival foods.

Metrecal market: Survey by Macfadden Publications found over a third of wives of wage earner families had dieted within past year.

(Turn page)

GENISCO TRANSISTORIZED CONVEYOR CONTROLS

Get the most in efficiency and reliability from your conveyor system with these new Genisco Electronic Conveyor Controls. Utilizing the electronic industry's most advanced transistor circuitry and modular construction, Genisco Model OC1100A Electronic Conveyor Controls reduce maintenance costs and provide higher speeds for greater productivity. Genisco solid state electronics eliminate many of the potential trouble points of mechanical controls. Add savings in time and operating costs to your product handling with Genisco Electronic Conveyor Controls.

- Completely transistorized
- Cast aluminum housing with moisture proof seal
- No warmup, instant start
- Adjustable, stop and start time delays
- Modular construction for quick checkout, easy maintenance
- Sensing head - control box connecting cable up to 1000 ft. long.

OPTICAL SENSING HEAD

Completely moisture sealed . . . Long life source lamp . . . Pre-aligned light beam for precision control . . . Rugged all-aluminum construction, stainless steel hardware.

Genisco INCORPORATED

2233 Federal Ave., Los Angeles 64, California

Marketing Signals (continued)

Bigger Ad Budgets Pep Up Sales, Net

The Food industry's 25 biggest advertisers (table) scored a solid profit boost and middling sales gains last year, a Food Engineering analysis of published data discloses. Hiking their ad spending 3.1%, the leading merchandisers were able to score a striking 7.1% profit improvement on the heels of a 1.9% pickup in sales.

The financial data were compiled by FE from the firm's quarterly statements, where possible, to put sales on a calendar year basis. The ad total was derived from published figures for the following media: Spot and network TV, newspapers, general magazines, farm magazines, outdoor billboards, and industrial publications.

As you can see from checking the performance of individual companies, **the old formula of budgeting advertising as a percentage of sales is pretty well ruled out by today's more scientific management.**

Thus, among the 25 biggest advertisers (who spent a whopping $374.5-mill. on consumer wooing out of the industry's close to $1-bill. total), the share-of-sales ratio shows a wide range. At the low end are Swift's 0.5%, Armour's 0.6%, and Bordon's 0.8%. At the opposite end of the scale, you have American Chicle's 10%, Wrigley's 8.9%, Kellogg's 8.2% and Jos. Schlitz with 6.5%.

On an overall basis, the 25 as a group devoted 2.5% of their aggregate sales last year to advertising vs. 2.4% in '59.

Among the 25 pacesetters, the 18 outfits who fattened their ad budgets made out significantly better than the 7 who pruned their spending. For example, the budget-increasers lifted their ad spending an average 10%—and upped their sales 10%, their profits 8%. The budget-cutters cut back their advertising an average 11% — ended up with both sales and profits edging up only 3%.

Food Industry's Top 25 Advertisers

Company	'60 Sales (000)	% Change vs. '59	'60 Profits (000)	% Change vs. '59	'60 Adv. (000)	% Change vs. '59
1. General Foods	$1,154,447	+10.5	$65,426	+8.0	$65,069	+7.8
2. General Mills	557,152	+3.6	13,036	−1.2	29,958	−0.9
3. National Dairy	1,667,176	+3.8	50,667	+2.6	22,743	+3.5
4. Kellogg	256,173	+5.7	21,487	+11.2	20,856	−4.2
5. Campbell	547,672	+5.7	42,533	+16.6	20,528	+17.4
6. Standard Brands	526,549	+0.9	17,524	+10.5	18,272	+12.5
7. National Biscuit	451,795	+5.3	27,949	+13.9	16,205	+12.0
8. Corn Products	691,370	+2.2	38,185	+15.1	15,428	+3.9
9. Quaker Oats	329,123	+1.9	13,709	+2.4	13,975	+8.5
10. Pillsbury	375,042	+2.1	7,011	−0.8	12,846	−18.5
11. Coca-Cola	501,987	+13.7	39,341	+2.8	12,050	+1.6
12. Anheuser-Busch	308,755	+4.3	15,416	+18.3	11,869	+5.9
13. Armour	1,735,600	−7.2	16,211	+15.2	11,482	+13.8
14. Swift	2,442,542	−1.3	18,413	−3.4	11,101	+24.2
15. Continental Baking	410,642	+6.4	9,311	−0.1	10,489	−29.2
16. Pepsi-Cola	157,672	−0.1	14,181	+2.2	10,221	+18.1
17. Jos. Schlitz	155,469	+1.9	8,838	−15.5	10,070	−1.0
18. Ralston-Purina	509,719	−3.5	18,168	+4.2	9,391	+5.3
19. Carnation	417,629	+5.4	11,152	+11.7	8,853	+0.9
20. Wm. Wrigley	100,546	+8.6	10,250	+1.4	8,518	+16.8
21. Borden	956,014	+1.6	26,856	+5.1	7,518	−33.6
22. H. J. Heinz	351,123	+7.3	13,065	+11.2	7,432	+2.5
23. American Chicle	70,309	+2.3	9,857	+4.2	7,062	+21.2
24. Beech-Nut	118,291	+2.3	8,978	+10.8	7,001	−3.7
25. California Packing	358,165	+1.6	15,685	+7.9	5,548	+16.9
TOTAL	$15,150,962	+1.86	$532,979	+7.09	$374,485	+3.13

SOURCES: *American Newspaper Publishers Assn., Associated Business Publications, Farm Publication Reports, Outdoor Advertising Inc., Publishers Information Bureau, Television Bureau of Advertising, Corporate Financial Reports.*

CIRCLE 82 ON INQUIRY CARD

CIRCLE 83 ON INQUIRY CARD →

MARLEX*... for quality packaging with greater sales appeal!

Which of these modern packages is right for your product? Whether it's a blow molded bottle, extruded tube, film overwrap, a thermoformed or injection molded container; the result will be increased sales appeal with a package made of MARLEX plastics. Attractive appearance . . . excellent feel are two reasons. Wide temperature range is another. MARLEX high density polyethylenes and ethylene copolymers withstand temperatures from 250° to −180°F. Alkalies, acids, chemicals, oils and greases are no problem. And MARLEX is odorless, tasteless, non-irritating, and biologically inert.

To packagers, the high quality of MARLEX resins means truly efficient package production . . . easier printing, wrapping, filling, sealing. With MARLEX you're sure of package performance . . . verified and supported by extensive research data.

*MARLEX is a trademark for Phillips family of olefin polymers.

For more information on MARLEX high density polyethylenes and ethylene copolymers . . . medium and low density polyethylenes—see your package supplier . . . or contact us directly.

PHILLIPS CHEMICAL COMPANY
Bartlesville, Oklahoma
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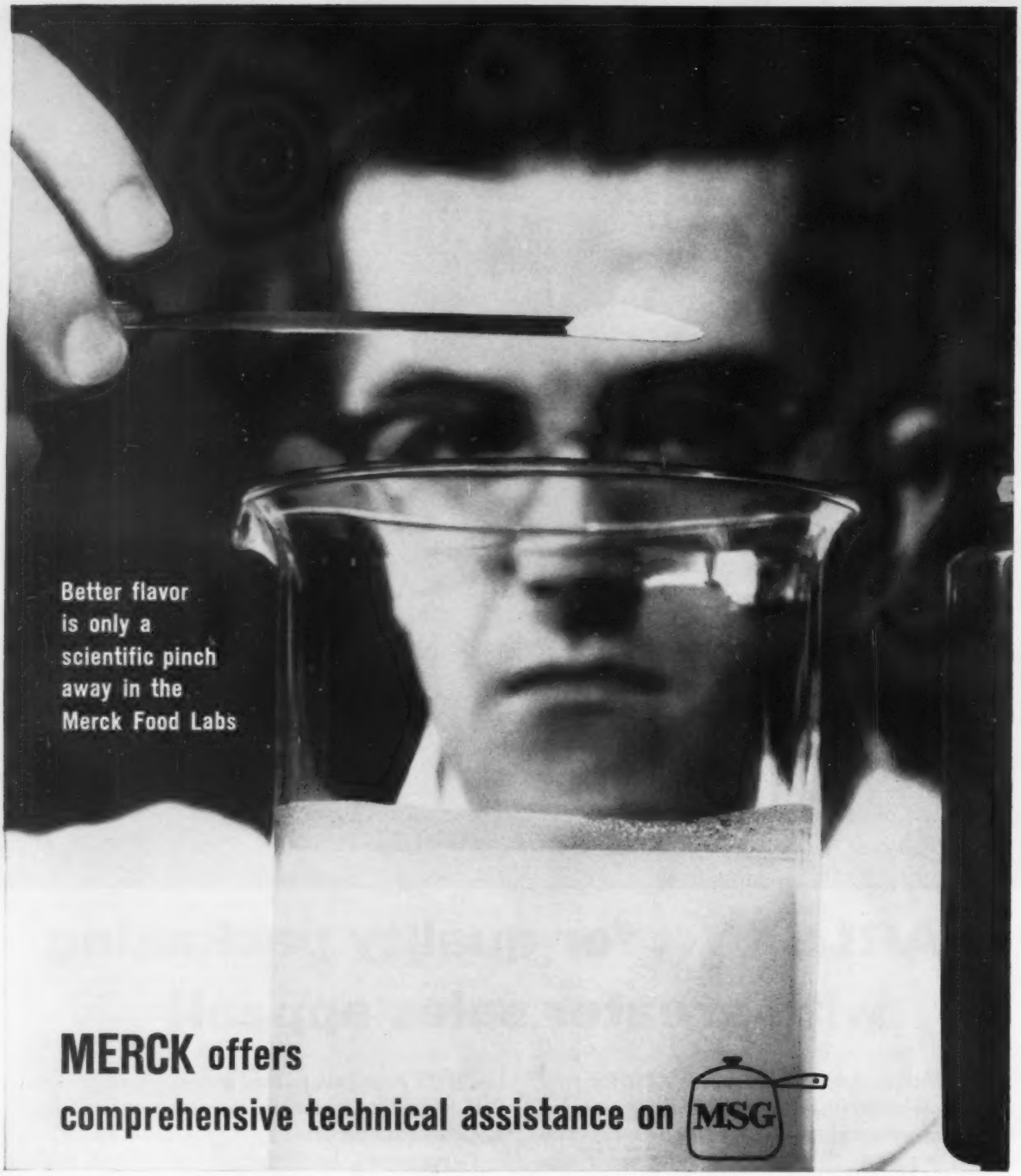
PHILLIPS 66 MARLEX PLASTICS



MERCK offers comprehensive technical assistance on MSG

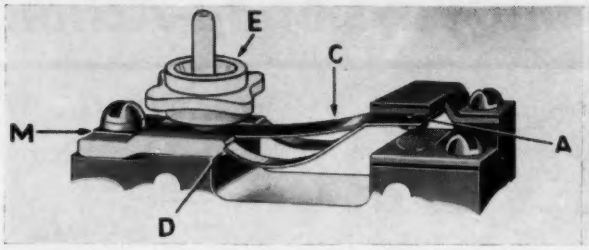
It doesn't always take a major change in formulation to effect an improvement in a food product's flavor. Sometimes it can be done with the equivalent of a pinch of MSG . . . or a slight modification in formula to get the most out of the MSG that is already in the product. It's all a matter of experience with MSG and a desire to work hard for the right answer.

You'll find specialists in the Merck Food Laboratories strong on both counts. This creative group offers a broad range of technical services relating to the use of MSG, from evaluating your new product formulations to improving flavor of your existing products.

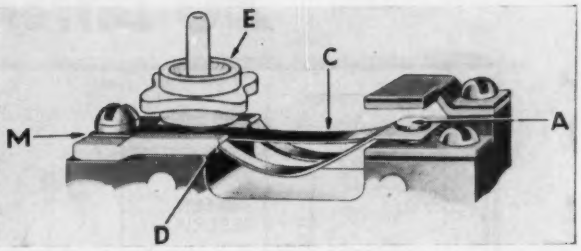
Just as a reminder, Merck is in a better position than ever before to satisfy your appetite for MSG. A $2 million plant expansion has increased production capacity for Merck MSG by 100%. For details on delivery of MSG or technical assistance on its use, simply call your Merck representative.

MERCK CHEMICAL DIVISION
MERCK & CO., INC. • RAHWAY, NEW JERSEY

How Snap-Actions Operate



UNOPERATED POSITION: Moving contact (A) is firmly held against upper normally closed contact by vertical upward component of force exerted by two side-compression members of one-piece beryllium-copper spring (C) supported as a cantilever at (M). Spring's two side members (blades) are, in turn, supported in anchor grooves (D).



OPERATED POSITION: When operating force acting on plunger (E) deforms center (cantilever member) of spring, downward vertical component overcomes vertical upward component supplied by two side compression blades. Moving contact (A), then snaps from upper to lower fixed contacts with rapid snap-action motion.

Snap-Action Switches Work for You . . .

. . . by providing accurate, low maintenance control of production machines and by protecting personnel, products, and processing equipment

YOU MAY NOT be aware of the many things that snap-action switches can do for you. These versatile tools can perform in a variety of ways to make your food plant operations more efficient and profitable. Here's how they can help you:

. . . **Limiting.** They'll shut off power (break circuits) driving a traveling mechanism when moving unit reaches predetermined point.

. . . **Controlling.** They'll close circuits to operate motors, solenoids, pneumatic and hydraulic valves—usually as a step in process-sequence control.

. . . **Providing safety measures.** They'll protect operators, prevent damage to machines, products or packages.

Range of application is practically unlimited, since these precision switches are finding considerable use for controlling:

1. Processes. Here, they're doing such things as controlling tension (on belts and packaging film), weighing and sequence timing.

2. Motions. They're used, here, along with cams and dogs. Adjustable cams on reciprocating rods, for example, actuate control switches. Similarly, switches are used to limit travel—like that of a machine carriage.

3. Thickness. They gauge and control thickness. Employed are double-thickness detectors, thickness limit switches, and "go, no-go" gauges. One example is carton blanks being fed into a set-up machine to prevent two blanks from entering forming area.

4. Level. They're controlling levels in many ingenious ways. Examples are use of reset switches with double-action float and high-pressure area floats controlled by diaphragm flexure.

5. Temperature and pressure. They're employed in conjunction with bellows, bimetal and expanding rod thermostats as well as various pressure actuators.

6. Special devices. They're used for sorting, counting and feeding. And they can control the feed of materials like crowns being chute-fed to bottle-closing machines. They're also employed as door switches for protecting rooms and other enclosures.

Most plant people refer to them as limit switches. Their construction is simple, and they're rugged for long uninterrupted operation. What's more, they require minimum maintenance. Basically, they consist of a snap-acting spring arrangement (see above photos) mounted in relatively small enclosure and operated by a plunger extending through case.

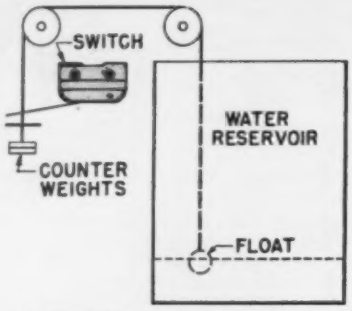
Actuator types — hundreds of them—make operations possible at various angles, speeds and forces. Available are switches with such actuators as **pin plungers** (with accurate operating characteristics), **compact overtravel plungers** (for use with slow-moving cams for less than 20-deg. rise), **rigid levers** (for slow cams or slides), **long levers** (for excessive impact, bending and overtravel), **roller lever** (for fast cam operation), **yoke actuators** (for reverse motions), **one-way actuator** (actuates on forward motion, skips on return), **flexible coil springs** (for conveyor applications), **roller** plungers (for cams with 30-deg. approach angles), etc.

Their Action & Advantages

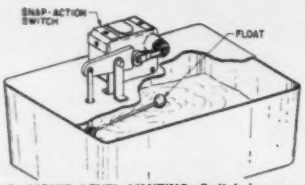
Operation and performance of a snap-acting switch differ from knife, mercury and ordinary wall type switches. It gets its name—

JOHN V. ZIEMBA, Senior Associate Editor "Food Engineering," Chicago

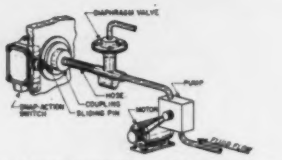
20 Different Ways Snap-Action



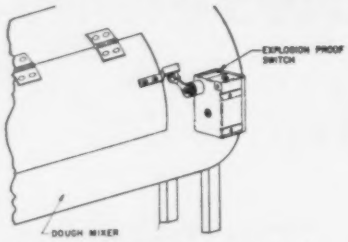
1. SIGNALLING: Leaf actuator switch signals low water level in concrete reservoir. When level's low, counterweight touches switch actuator to light remotely located red lamp.



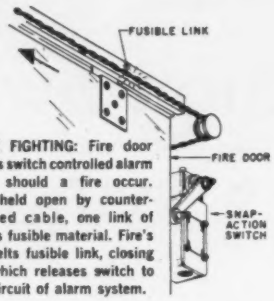
2. LIQUID LEVEL LIMITING: Switch insures liquid within boiler is within minimum-maximum limits. When level is either on low or high side, a dual cam actuates switch, turning on a warning light to signal operator.



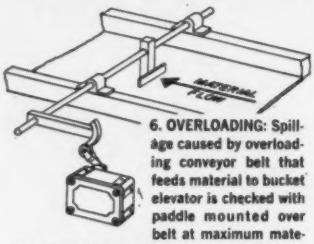
3. HOSE COUPLING: Switch prevents hose from discharging until coupling fixture (located some distance from pumping station) is properly secured. When hose is coupled, fixture actuates switch to close circuit of pump motor.



4. MACHINE STARTING: Switch on cover of mixer prevents opening cover while mixing blades are in motion and starting of mixer until cover is closed. Switch is mounted on mixer's hinged cover.

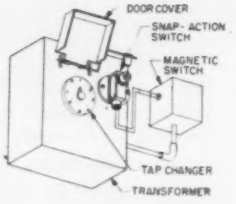


5. FIRE FIGHTING: Fire door operates switch controlled alarm system should a fire occur. Door's held open by counterweighted cable, one link of which is fusible material. Fire's heat melts fusible link, closing door, which releases switch to close circuit of alarm system.

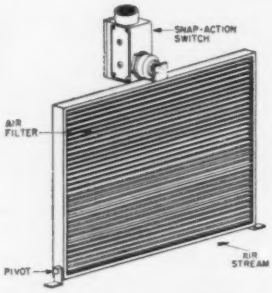


6. OVERLOADING: Spillage caused by overloading conveyor belt that feeds material to bucket elevator is checked with paddle mounted over belt at maximum material depth. When material exceeds this depth, paddle moves to actuate switch. Single-pole double-throw switch then sounds alarm, stops belt's motor.

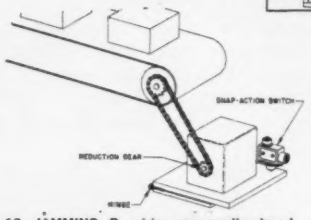
7. CONTROLLING BIN LEVEL: When material reaches certain level in a bin, pressure flexes diaphragm, which actuates switch that automatically stops inflow.



8. DISCONNECTING TRANSFORMER: Switch prevents changing taps on this high-voltage transformer until power's been cut off. Raising hinged cover installed over tap actuates switch that causes primary switch to magnetically disconnect transformer from line.



9. FILTERING: Switch installed behind remotely located air filter notifies maintenance men when filter needs cleaning. Filter's mounted on a pivoted frame. When filter's clogged with dust, increase in air pressure pushes frame against switch, closing circuit to warning light.



10. JAMMING: By wiring a normally closed snap-action reset switch in motor circuit, conveyor jam-ups are avoided to prevent equipment or product damage if motor's not shut off in time. If jam occurs, hinged reduction box gear rises to depress switch's plunger and shut off motor.

snap-action — from fast contact snap-over (4 milli-seconds) on either make or break.

Chief advantages of snap-action switches are their repeatability, service life, high- and low-head handling capacities, electrical ratings, and resistance to vibration (also impact and acceleration). These are in addition to their adjustability, flexibility and low maintenance requirements.

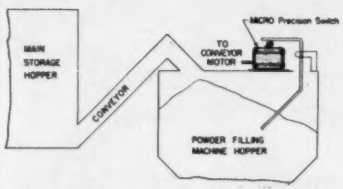
► **Repeat accuracy.** On full rated electrical loads, most of them are limited to 300 continuous movements/min. on 60-cycle applications. Electrical characteristics of certain ones permit them (on small electrical loads) to follow movements up to 1,800/min.

Repeat accuracy's of the same order. With some it's about 0.0005 in. under light loads (0.1 amp.), increases to 0.005 in. under maximum load. Wear-resistant guides on some repeat, with a variation of plunger-operating position, not over 0.0001 in.

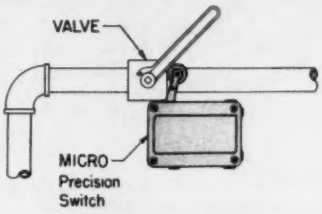
► **Service life.** In many instances, probable life is over a million operations when switches are loaded at their rated capacity. On small electric loads, it's limited by mechanical life of snap-acting mechanism. On heavy loads, it's limited by disintegration of contact material and roughening of contact surfaces—to the danger of sticking due to mechanical interlocking of roughened surfaces.

► **Electrical ratings.** Many of the precision snap-acting switches are Underwriter-rated for 1,200 volt-amp., a-c, from 115 to 460 v. Some are UL rated at 15 amps. at 125,

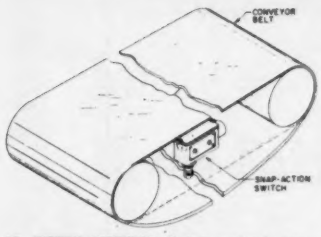
Switches Can Control Operations



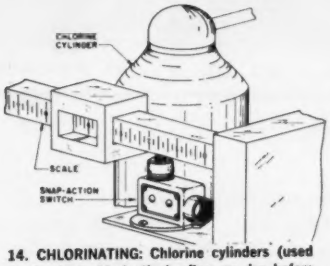
11. HOPPER LOADING: Switch on powder-filling machine controls motor on conveyor delivering material from storage bin to filler's hopper. Material's pressure on pivoted actuating vane in filler hopper operates switch to open conveyor-motor circuit when product reaches predetermined level.



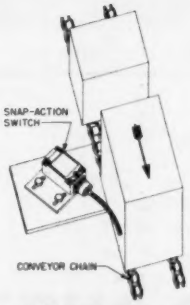
12. OPERATING VALVE: Switch with roller-arm actuator used in liquid-valve operation offers freely adjustable feature. When valve is opened, switch's adjustable spring-loaded lever arm automatically closes circuit to remotely located motor.



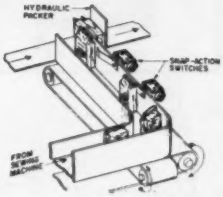
13. MOTOR BURNING: Switch motor is prevented from burning out when material jam-ups cause conveyor belt to slip. Conveyor works properly when belt has some slack. In event of a jam-up, belt tightens and actuates switch that shuts off motor.



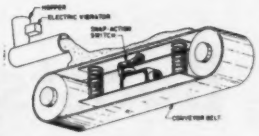
14. CHLORINATING: Chlorine cylinders (used for in-plant chlorination) often go dry before operator remembers to change them. Solution's to mount cylinder on scale and install switch under scale arm. When chlorine supply is very low, scale actuates switch to turn on warning light or alarm.



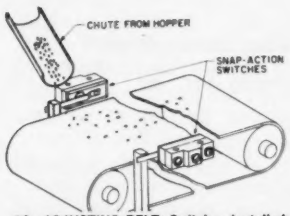
15. COUNTING: Snap-action switch maintains accurate count of irregularly shaped objects traveling on conveyor. Switch is equipped with coil-spring actuator, and slotted mounting bracket permits adjustment of position.



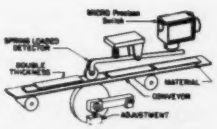
16. PILING UP: Two switches installed on feed conveyor prevents bags of sugar from piling up when hydraulic packer jams. Such pile ups result in torn bags and damage to sewing machine.



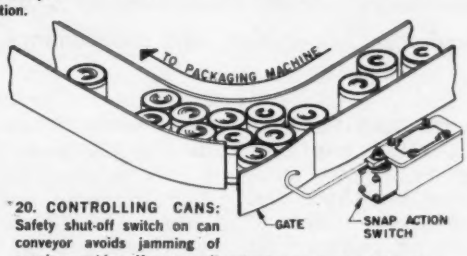
17. FEEDING: Switch controls vibrator on hopper to prevent product in overhead hopper from bridging over and failing to feed onto conveyor belt. If flow of material stops or slackens, switch is released to close circuit to vibrator.



18. ADJUSTING BELT: Switches installed on either side of overhead conveyor keep belt from running off pulleys, prevent spilling of material and tearing of lacings. When belt travels off center, it pushes against a rod that actuates one of the switches and sets off an alarm to notify operator below to adjust belt.



19. CHECKING THICKNESS: Switch mounted on conveyor feeding product pieces signals operator, stops belt in event of double thickness. Mechanism's adjustable for varying thickness.



20. CONTROLLING CANS: Safety shut-off switch on can conveyor avoids jamming of canning machine. If cans aren't unloaded as fast as they're filled, they start backing up on conveyor gate. Pressure opens gate to actuate switch which, in turn, stops canning machine.

250 and 460 v. (a-c); ½ amp. at 125 v. (d-c); and ¼ amp. at 250 v. (d-c). Others are 20 amps at 125, 250 or 480 v. (a-c) and 10 amps at 125 v. (a-c).

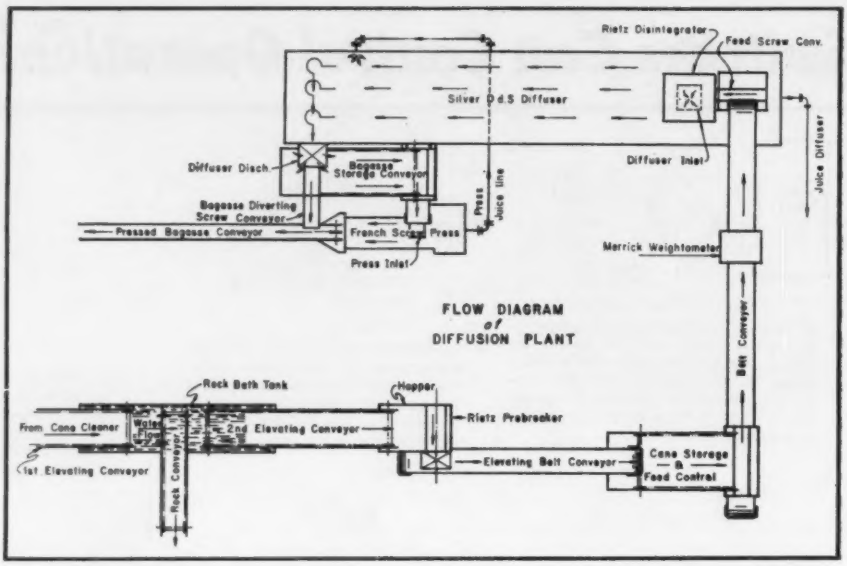
► **Resistance to vibrations.** High pressure is necessary between contact to resist tendency of entire assembly's motion to jar them apart or into false contact position. Such pressure is, however, increased with stiff spring elements.

Pointers on Installation

Switches constantly operated in presence of moisture, oil, dust or water sprays must be of sealed or moistureproof design. Best alternate is to improvise some way to shield switches. Most of them operate satisfactory within a zero to 160-F. range, beyond which supplier must be consulted.

It's best to mount switches so actuating force is in direct line with movement of switch's plunger. They may be mounted directly to a structural member—like onto a machine, fixture, panel or bracket. To eliminate possibility of shorting, it's a good idea to insulate (with fiber or glass cloth) switch from metal section onto which it's mounted.

Here are other insulation suggestions: (1) mount switches only against flat surfaces, (2) make sure lock washers don't bear directly against switch's plastic case, (3) don't tighten screws so phenolic switch case will crack, and (4) avoid overloading on a-c or d-c circuits to minimize contact roughening and to prevent welding of contacts. (End)



FLOWSHEET of diffusion process traces the flow of sugar cane through disintegration, extraction, and pressing operations.

Hawaiian Diffusion Process

Boosts Cane-Sugar Yield

Revolutionary system offers over 98% juice extraction—plus striking economies in equipment, operation, and maintenance. Commercial plant planned for '62

SUGAR-MILL OPERATORS have long sought a better way than roller milling to extract juice from cane. Now they have one, according to plant-scale tests of a diffusion process perfected by technologists of the Hawaiian Sugar Planters' Experiment Station, Honolulu.

The new technique offers these four impressive advantages over conventional roller milling:

► **Extraction of up to 99%** of the sugar, as against an average of only 94% by milling. This promises recovery of $5-6 million worth of sugar a year, which is now either lost entirely or ends up in the less valuable molasses.

► **Lower equipment cost**—about half that of a mill of comparable capacity.

► **Design simplicity**, which cuts maintenance costs considerably.

► **Far less power consumption.**

The process has been called 'diffusion' for lack of a better name. Actually, very little diffusion occurs in the sense that the term is used in beet-sugar processing. Instead, the juice is extracted by a three-step process:

1. Disintegrating the cane so that 94% or more of the cells are ruptured.
2. Washing the juice from the fiber counter-currently, and
3. Dewatering the bagasse.

Extraction Efficiency

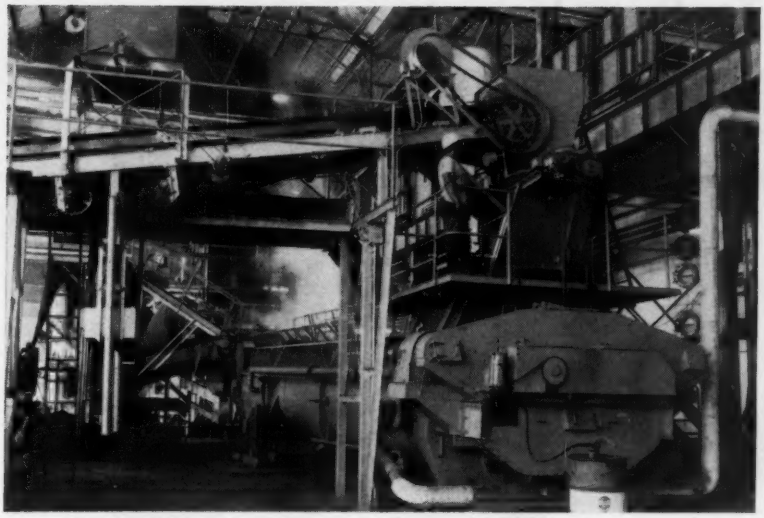
Bag. Pol, %	Extraction, % (Av. 96.9)	Dilution, % A. J. (Av. 47.1)
Below 0.80	98.8	52
0.80-0.99	98.0	52
1.00-1.19	97.5	52
1.20-1.39	97.1	49
1.40-1.59	96.8	52
1.60-1.79	96.2	42
1.80-2.19	95.7	40

System in Action

The plant at Kekaha, Kauai, processes about 20 tons of cane/hr. As shown in diagram, cane is retrieved directly from the cleaning plant, passed through a secondary rock bath, and then to a 15-in. screw-type unit. Employing low speed and high torque, the broken-flight machine cuts the cane as its screw sections work against fixed anvils.

Thus reduced to 3-4 in. in length, cane is conveyed to a storage hopper, then discharged by a variable-speed conveyor controlled by a belt scale. Next, a small scroll feeds a relatively constant flow of cane into a vertical swing-hammer device, which shreds the cane and also reduces length.

J. H. PAYNE
Principal Technologist, Experiment Station of the Hawaiian Sugar Planters' Assn., Honolulu.



DIFFUSION AREA: In 40-ft.-long unit (bottom right), disintegrated cane is conveyed counter-current to a flow of water.

Cane then discharges directly into the diffuser. It has intermeshing perforated double scrolls (52 in. dia.), which rotate at about 1 rpm. and convey the disintegrated cane counter-current to a flow of water for a length of 40 ft. The machine slopes upward at an angle of slightly over 2 deg.

Juice effluent is pumped from the diffuser at a point below where the cane enters. Bagasse is discharged from the upper end by means of 45-deg. scrolls onto a cross scroll and into a storage hopper. Latter controls the feed to an expeller-type machine from which the bagasse discharges onto a conveyor. Meanwhile, juice is squeezed through the cage bars, and falls into a trough from which it is pumped back to the discharge end of the diffuser.

During two seasons of processing 22,308 tons of cane, variables such as feed rate, dilution, temperature, and state of preparation were studied for their effects on the extraction efficiency. Also, tests were conducted on diffusion juice to determine its clarification and sugar boiling characteristics.

Operating Data

A summary of extraction data from all runs during the 1960 season is shown in the accompanying table, in which figures are arranged by bagasse pol. Extraction varied from 98.8 to 95.7% in these groupings, and dilution from 52 to 40%. Actually, in individual runs, dilution ranged from 20 to over 100%, and extraction from 95 to over 99%.

Taking the runs as a whole, there appears to be little correlation between extraction and dilution. The principal factor, however, governing extraction is state of preparation of the cane. High extraction followed good preparation even at lower dilution rates. On the other hand, large amounts of water were ineffective if cane preparation was inadequate.

Although counter-current extraction occurs with more efficient use of water, the leaching nature of the process is apparent. Thus, 'diffusion' assumes a new aspect. Time of contact and temperature, which are very important in beet diffusion, are secondary considerations.

With true diffusion, the juice would be expected to be of higher purity than mill juice. However, with almost complete cell rupture, we are dealing with essentially absolute juice, which is of lower purity than of mixed juice from the mill.

Nevertheless, clarification tests on juice from the pilot plant showed no difference from mill juice. Similarly, sugar boiling and refining tests indicated that sugars from these juices were at least equal in quality to those boiled from mill juices. (End)

The above feature is an abstract of the paper "New Concepts in Cane Diffusion," presented by Dr. Payne at a recent meeting of the Hawaiian Sugar Technologists. The paper will be published in the society's 1960 Reports.

Extrudes Bread Dough for Home-Baking

Continuous line turns out one frozen loaf per sec. It's baked right in its aluminum-foil package

FROZEN BREAD DOUGH, ready for home-baking in its own packaging, is being made by a new continuous dough-making and extrusion process. Product was introduced by Homade Bread Co., Sacramento, Calif.

The special dough-making equipment, for which patents have been filed, was developed by Homade's president, J. W. Rich. It continuously mixes, kneads, and extrudes the dough. The resultant strand is then automatically cut and shaped, sent through a quick-freeze unit, and deposited on a packaging table. To speed heat transfer in the freezer, dough pieces are rotated 13 times.

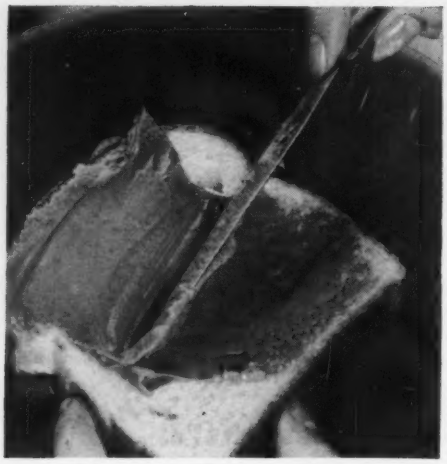
A frozen loaf is ready for packaging just 10 min. after dough ingredients go into the hopper. According to Rich, a 2-man operation can turn out 24,000 loaves a day. Moreover, this rate can easily be doubled. Minimum daily production is considered to be about 9,600 loaves.

Two loaves, each 1¼ lb., are placed in a carton made of zinc sulfite board and laminated inside and outside with aluminum foil. The outer foil layer is coated with a heat-sealing compound.

For baking, the housewife simply places one loaf in the lid, the other in the bottom of the box. After loaves have thawed and risen, they are put in the oven.

The two-loaf package is priced at 49¢. Homade Co. intends to enter one market at a time, set up the business, and then turn it over to a franchised operator. (FE Staff)

Textures for sale



In fat-based foods *Myverol® Distilled Monoglycerides* are widely recognized for one group of effects. In shortening, for example, they so control the tricky relationship between batter "curdle," bubble size, and cell-wall strength that a wonderful cake texture comes out of the oven. They permit peanut butter to go to the beach on a July day without leaking oil, yet spread smoothly after a week in the refrigerator.

In starch-based foods *Myverol Distilled Monoglycerides* have won just as big a place for an entirely different effect—the complexing of dissolved amylose. Dehydrated potato products have enjoyed their rip-roaring success because they make up into a food that looks like, tastes like, and *is* mashed potato, not library paste. Hot cereals no longer need inevitably turn jellylike a certain time after cooking.

A very small content of these unique molecularly distilled monoglycerides profoundly affects the delicate architecture of foods. Prepared from the glycerolysis of edible fats or oils, *Myverol Distilled Monoglycerides* are exempt from the Food Additives Amendment. For technical data and prices write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

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Flavor Symposium Achieves Exchange of Research Data

Earlier this year at Camden, N. J., the Campbell Soup Co. held its second symposium on flavor chemistry. Outstanding scientists in this field were able to exchange ideas and discuss latest findings. Here are a few noteworthy facts on some of the topics discussed:

Meats. Basic precursors for meat flavor have been identified fairly well at this time. Proportions of various individual components have not yet been established. It appears that ribose or ribose phosphate on heating give the typical meat flavor. Heating these precursors in fat gives a steak or roast beef flavor. Heating them in water gives a typical boiled or bouillon flavor.

Evaluating overly cooked meat requires caution. Too many undesirable components are formed and isolated with the desirables. Question is how to separate and evaluate the relative importance of undesirables vs. desirables in such a case.

Chicken. Flavor differences among various types of birds are negligible. Meat (muscle) portion is the best source of flavor by broth tests. Fat and skin may be more important to fried, roasted, or broiled chicken.

Of the volatiles, sulfide and carbonyl compounds appear prominent flavor components. And in the latter group, diacetyl and acetoin seem to be significant precursors.

Fats and oils. Reversion flavor in soybean oil comes from a combination of compounds (e.g. carbonyls) rather than a single compound. Nor is linolenic acid wholly responsible for this reversion.

Salt develops off-flavor in meat by autoxidation of the fat. Perhaps metals or other catalysts in salt catalyze this reaction.

Milk. In instant nonfat dry milk, volatile carbonyl compounds from Maillard reaction and lipid deterioration, are involved in cereal flavor development. Minimal heat application during instantizing can help minimize this flavor development.

Cheese. In the breakdown products during Cheddar cheese ripening, free fatty acids and hydrogen sulfide appear to be major flavor precursors. Protein serves a dual role in cheese—as the structural element and as source of flavor components.

Limited number of copies are available on the proceedings of the flavor chemistry symposium. For your copy, circle no. 400 on the Reader Inquiry card.

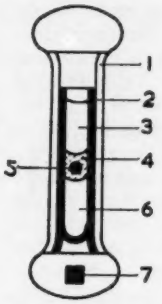


DIAGRAM shows structure of indicator. Parts are: 1. PVC tube (ends sealed). 2. Glass tube (1 ml.). 3. Aqueous solution I. 4. Non-aqueous layer (frozen). 5. Ball bearing. 6. Aqueous solution II. 7. Colored insert.

I. Aqueous Solutions, 50% Glycol

Soln. 1	Soln. 2	Color ppt.
1% Nickel sulfate	0.5% dimethylglyoxime	Red
1% Lead acetate	1.0% potassium iodide	Yellow
1% Copper sulfate	0.5% benzoin-oxime	Green
1% Cobalt nitrate	0.5% sodium hydroxide + 0.5% sodium carbonate	Blue

II. Non-Aqueous Separating Layer

Substance	M. Pt.
Methyl hexyl ketone	−6 F.
n-Decyl acetate	+5 F.
n-Dodecane	+10 F.
1-Nonanol	+23 F.

Visual Indicator Measures Maximum Temperature of Frozen Food Loads

During handling and storage of frozen foods, temperatures may rise so that the product suffers. This may not be apparent until thawing is noticeable which is too late.

A simple device, about 3½ in. long and expendable, has been developed for placement into a load of frozen food. It consists of two aqueous solutions separated by a frozen non-aqueous layer. Aqueous solutions are colorless, and when separating layer melts they mix to give a colored precipitate. These solutions contain glycol to ensure that they are liquid at operating temperature, and separating layer is immiscible with both. They are near saturation at room temp. and give a non-fading, easily recognized color.

It's best to indicate a given temperature by one color only and to mark this by a colored insert in the end of the PVC tube. A ball bearing is frozen into the separating layer to ensure mixing of aqueous layers. Indicator is placed horizontally in load and ball bearing movement helps mixing.

The two ends of PVC tube are easily sealed with pliers after heating in a stream of hot air. Frozen layer must be protected when final seal is made. Even if glass tube is shattered, loss of liquid is very small. Thus risk of contaminating food is negligible.—*Food Tech. in Australia,* 425, Aug. 1961.

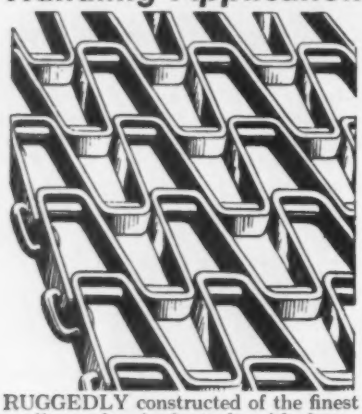
Antibiotics in Milk Present Problems

Antibiotics have helped control diseases and nutritional well-being of livestock. Their use in treatment of mastitis has created problems for the milk processor and the consumer.

Following treatment of mastitis, antibiotics may be found in milk in sufficient concentrations to inhibit dairy starter microorganisms, thereby causing economic loss to cheese and fermented milk industries. Penicillin in very small concentrations found in milk may irritate highly sensitive individuals.

Nation-wide surveys reveal that penicillin was the primary anti-

LA PORTE
FLEXIBLE STEEL CONVEYOR BELTS
Give
EXTRA
MILEAGE
in Every Food Handling Application



RUGGEDLY constructed of the finest quality galvanized steel, with knee-action-like flexibility, LaPorte Belts give longer wear with minimum maintenance. The open-mesh construction that flexes with every impact assures a positive drive on the LaPorte Sprocket. It also permits the free circulation of air and liquids around products in process to speed-up washing, draining, cooling, freezing, cooking, drying, dehydrating and sterilizing. In addition, LaPorte Belts provide a perfectly flat surface for all types of containers empty or filled.

If you process, package, store or ship food, it will pay you to use LaPorte Belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

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La Porte, Indiana

Please send free literature on your Conveyor Belt.

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biotic found in the central milk supply. Ten surveys covering a 9-yr. period (prior to 1960) in which 7,201 samples were tested, found 377 (5.2%) to be positive for the presence of antibiotics. The application of testing methods by regulatory and dairy personnel during 1960 resulted in a significant reduction in antibiotic-adulterated milk. Analyses of 770,000 producer milk samples showed an incidence of 0.54%—a tenfold decrease.

When antibiotics are used to treat mastitis, dairymen should follow the prescribed recommendations for withholding milk for human use following treatment.—*Jour. of Dairy Science*, 779-807, May 1961.

Sucrose Monoacetate Has Many Food Uses

Sucrose monoacetate is a white, crystalline powder with a slightly sweet taste, melting between 80 and 82.5C. It is highly hygroscopic, very soluble in water and resembles sorbitol in its hygroscopicity, though it absorbs more water than sorbitol (17.2% by weight, compared to 10.5% for sorbitol).

It is cheaper to make than sorbitol, since acetylation is a simpler process that requires simpler equipment than hydrogenation. Sucrose monoacetate can be used as a humectant in place of sorbitol. Another potential use for it is that of an intensifier for food flavors. It has been shown that the aroma of products packed with sugar is stronger than it is in those packed with water.

The use of sugar for this purpose is limited to fruits, desserts, and other foods where sweetness is desirable or at least not objectionable. A compound similar to sugar but lacking its sweetness could extend the use of this property to many other foods and sucrose monoacetate could be such a product.—*Jour. of Applied Chemistry*, 7-10, 11(1), 1961.

Tetrazolium Compound Aid Bacteria Controls in Meats

Biological control of cooked meat production is usually carried out by plate counting methods. This gives an approximate estimate of the number of bacteria in the sample, but little information about the distribution of the organisms in it. Since the test takes up to two or three days to complete, its utility for control of production processes is limited.

The tetrazolium compounds have been applied to this problem since these colorless substances are reduced by living organisms to the bright-colored insoluble formazans. For meats the most satisfactory of the tetrazolium compounds is 5-phenyl - 2-(p-iodophenyl) - 3-(p-nitrophenyl) tetrazolium chloride. This gives a rapidly developing purple formazan, easily visible on meat surfaces.

To use the reagent a 0.5% solution of the tetrazolium compound is prepared and sterilized for 20 min. at 10 psi. The meat samples are incubated for 17 hr. at 30 or 37C. in film pouches, then sprayed with the reagent, and incubated at 37C. for 15-30 min. Red-purple areas develop wherever bacteria are present. Contamination resulting from tools used in handling or cutting the meat, cooling water, or slicing equipment are usually detected readily.—*Jour. of the Science of Food & Agric.*, 12, No. 4, 341-344, April 1961.

Package Influence on Cottage Cheese Temperature

In experiments concerning the effect of package on the temperature of Cottage Cheese, two basic types of conditions were used: When product was in thermal equilibrium with an open-top retail display cabinet, and when product was subjected to warming and cooling conditions. Packages used included foil - surfaced and fiber - surfaced cups and boxes.

Foil surfaces will keep the product an ave. of 3.3C. colder in warmer regions of a display cabinet than will fiber surfaces, regardless of package shape. As a result of radiant heat exchange between a stack of fiber cups and a stack of foil cups in the cabinet, the temperature of cheese in foil cups rose 0.6C., with no temperature change in the fiber cups.

Under warming and cooling conditions, the overall coefficient of heat transfer, the degree of curvature of time-temperature plot, and the time (in min.) required to reduce a temperature difference to 1/10th the original value were found to be more dependent on package shape than on packaging material.—*Jour. of Dairy Science*, 249-257, Feb. 1961.

A **Y Globe** that challenges comparison shows it pays to

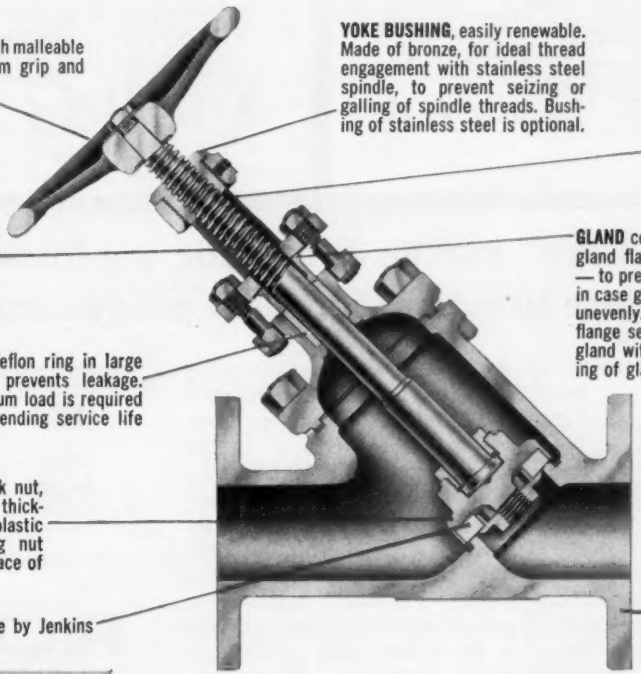
Specify JENKINS for STAINLESS STEEL **Valves,** too

Want the "best buy" in Stainless Steel Y Globe Valves? Compare this Jenkins Fig. 1335 with any on the market. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

You'll find genuine superiority of design and construction in the features shown here. But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

SEND FOR NEW CATALOG of Jenkins Stainless Steel Valves, in patterns and alloys that satisfy the requirements of practically all corrosive services.

These Jenkins Valves meet valve industry specifications and the high standards established by leading users of stainless steel valves.



WHEEL of high strength malleable iron designed for firm grip and easy operation.

SPINDLE of large diameter and dense structure has high resistance to wear and torsion strains. Easy, tight closing is assured by long, precision machined thread bearing surfaces. A beveled shoulder provides backseating against inside of bonnet, permitting repacking under pressure.

PACKING A Teflon ring in large packing box prevents leakage. Only a minimum load is required on gland, extending service life of packing.

DISC HOLDER, held by lock nut, has depth equal to disc thickness, preventing flow of plastic disc. Wide disc retaining nut covers all but seating surface of Teflon disc.

DISC is Teflon made by Jenkins

YOKE BUSHING, easily renewable. Made of bronze, for ideal thread engagement with stainless steel spindle, to prevent seizing or galling of spindle threads. Bushing of stainless steel is optional.

YOKE BONNET, a single unit, has liberal space between yoke arms for easy access to packing box. Tongue and groove joint with body makes a pressure-tight seal with less tightening on the bolts, and eliminates possibility of blowing out the Teflon gasket.

GLAND consists of two pieces — gland flange and gland follower — to prevent binding of follower in case gland bolts are tightened unevenly. Crowned surface of flange secures tightness against gland without excessive tightening of gland nuts.

BODY Through-port design for full, free flow. Liberal seat height permits repeated refacing. Cast on body are directional arrow and bosses for drain connections. End flanges conform to M.S.S. specifications.

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LOOK FOR THE JENKINS DIAMOND
VALVES

Sold Through Leading Distributors Everywhere

JENKINS BROS., 100 Park Avenue, New York 17, N. Y.

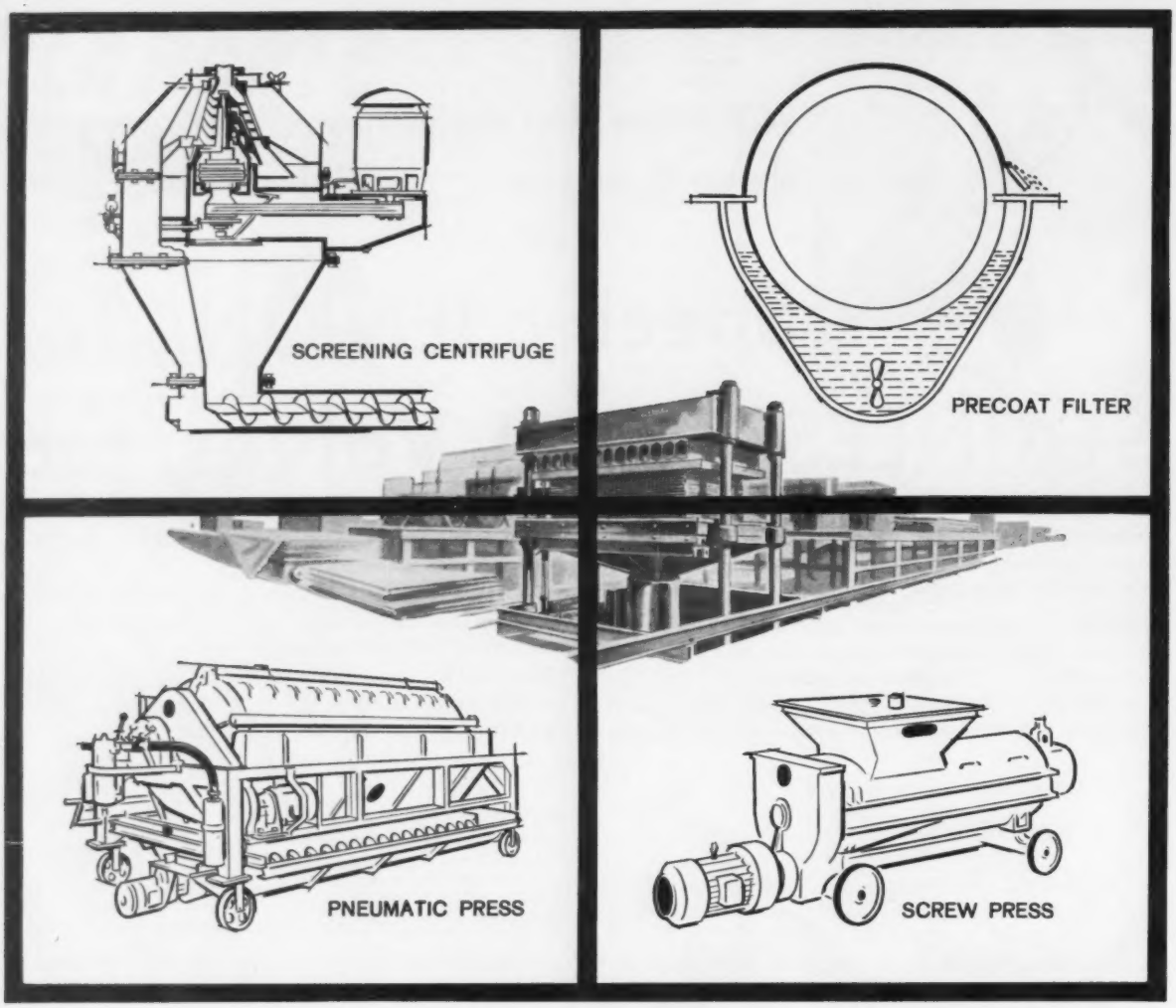
☐ Send the new stainless steel valve catalog

☐ Have a representative call on me

NAME & TITLE.....

COMPANY.....

ADDRESS.....



Pectinol® makes automatic equipment more practical for juice processing

With the help of PECTINOL enzymes, many fruit juice processors are now replacing conventional, batch hydraulic presses with modern efficient equipment. In crushed fruit, PECTINOL enzymes break down pectins in pulp structure and give faster release of juice. In the extracted juice, the enzymes act on colloidal pectin which keeps tiny pulp particles suspended through protective-colloid action. Breakdown of the protective colloid allows the pulp particles to settle and be filtered. Such pectin hydrolysis is frequently a lifesaver in unblocking bottlenecks encountered in running the new equipment. For example, in Garolla and Willmes presses, PECTINOL reduces the troublesome slipperiness of Concord grapes. In using a precoat filter for clarifying apple juice extracted by a screening centrifuge, PECTINOL action on the high content of solid material avoids clogging of the filtering surface. Whatever fruit you process, whatever equipment you use, it is likely that PECTINOL enzymes can help you increase processing efficiency and give your juice more brilliant clarity.

Write to Dept. SP-15 for information, technical literature, and enzyme samples.

ROHM & HAAS

PHILADELPHIA 5, PA.

PECTINOL

Big Innovations in Packaging Ahead

Recent developments point to startling changes in types of containers and materials

AMERICAN CAN CO.

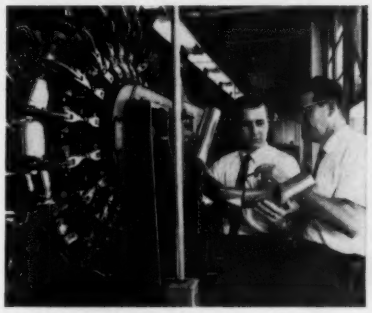
Develops High-Speed Can-Making Unit

A UNIQUE can-making machine that can make cans from aluminum, standard tin plate, double-reduced tin plate, and "tinless" steel plate coil has been developed by American Can Co. It can operate at a speed of 2,000 cans/min., compared to 600/min. for present machines.

The first of these machines will begin producing cans commercially at one of Canco's plants early in 1962. A single machine can handle any type of metal used in can-making, and has replaceable parts to make various sizes of cans.

Machine's principle is continuous or straight line manufacturing from a coil of metal sheet. Standard machines operate on a reciprocating principle which limits operating speeds and types of materials handled.

New machine forms a continuous ribbon of metal sheet into a tube, welds the sides together, and automatically cuts them into cans of proper size on a giant "Ferris wheel."



HIGH-SPEED can-making machine more than triples output of conventional equipment. Here inspection is made on section of uncut cans taken from machine before reaching cut-off wheel.

The challenge of aluminum and double-reduced tin plate as new can-making materials has been met by this versatile machine that can handle both at super speeds.

CONTINENTAL CAN CO.

Launches Diversified Container Research

EXPANSION AND CENTRALIZATION of Continental Can Co.'s scientific research facilities has resulted in construction of firm's new General Packaging R&D Laboratory in Chicago. Here 800 scientists and technicians have combined from Continental's six divisions.

Purpose is to stimulate the most advanced research possible in the packaging field. Some startling innovations are slated by the new research center—many of particular interest to food manufacturers.

Here's a glimpse into the future.

A blow-molding unit, capable of producing 75 plastic bottles/min. has been developed. This 25-cavity unit could conceivably produce bottles at 250/min., if an extruder could be found to match that pace.

Injection-molded polypropylene caps, with built-in gaskets, are being developed for White Cap & Bond Crown Div. Division representatives note that prices competitive with standard caps could result from mass production.

Flexible Packaging Div. has begun test marketing of a Mylar-foil-vinyl cook-in pouch with thermoplastic and thermosetting bonds, and produceable through conventional retort methods. Tomato paste and other acidic products are expected to be the biggest users of this one.

Continental has already developed Flex-on polyethylene bags for packing poultry. Now being introduced, these bags—reportedly less expensive than heat-shrink films—stretch to get the fowl in, and then offer nearly 100% snapback.

A low-cost, rapid method of ultrasonic sealing, in order to obliviate the need for adhesives, is slated for research efforts.

Polypropylene is being researched as a non-refrigerated package for processed foods that can yield several months of shelf life at room temperatures.

A project being undertaken by the Folding Carton & Drug Div. involves the elimination of the paper-making stage when converting paper pulp into containers.

Seamless plastic liners are being developed to enable fibre drums to handle a wider variety of liquids, including vegetable lards and citrus concentrates.

On tap is a unit that can print irregularly-shaped plastic containers, in four colors, at rates up to 100 bottles/min. Equipment is now in prototype stage in pilot testing area.

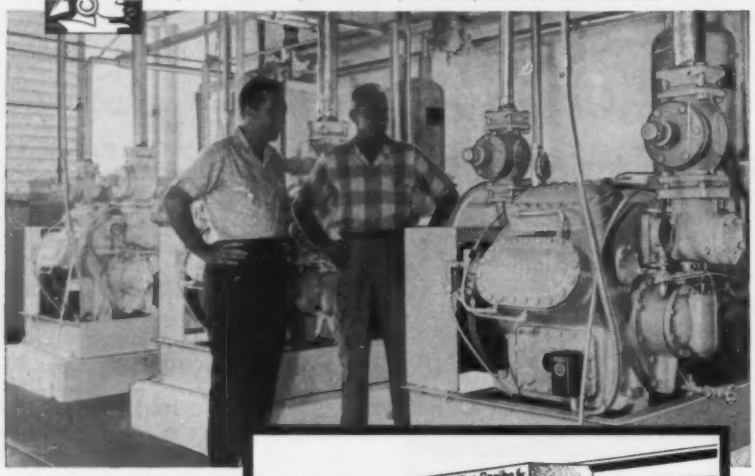
Glass coatings of colorful plastic are being developed for new decorative effects. Other coatings are being worked on that will exploit more of the natural strength of glass. One coating recently developed will withstand autoclaving and still has good lubricity.

(Turn page)

COMPOSITE CONTAINERS of paper, film, and foil are spiral wound by this machine at General Packaging. Continental is developing foil-laminated container with plastic liner, designed as container for frozen citrus concentrates and motor oils.

Renowned Star-Kist Tuna Quality Assured at Puerto Rico Cannery through Vilter Refrigeration—

STAR-KIST FOODS, INC., with headquarters at Terminal Island, California, packs a wide variety of tuna and special tuna products and other sea foods.



Refrigeration and air conditioning for the entire Star-Kist Caribe plant is provided by six 8-cylinder Vilter VMC compressors. Thomas W. Crump (left), President of Star-Kist Caribe, Inc., and Louis Marincovich, dock and fish room supervisor, are shown inspecting the ultra-modern refrigeration system.

Star-Kist Caribe tuna cannery fronting on the open sea of the Mayaguez roadstead, Puerto Rico. The modern tuna packing facilities here compare with the finest in the world.

Helping to meet the growing demand for canned tuna products in the world markets is the Star-Kist Caribe cannery in Puerto Rico. Because of the specialized problem created by the plant's tropical location, effective refrigeration was of vital importance. Vilter refrigeration was selected to meet the demanding environmental conditions.

Six 8-cylinder Vilter VMC compressors were installed to fulfill the refrigeration and air conditioning requirements of the entire plant. As the fish are unloaded from the tuna seiners they are immediately placed in a 165,000 cu. ft. cold storage freezer where they are frozen and held at 0° F. When the tuna are ready for processing they are thawed, butchered and cooked. Cooling is then necessary prior to packing and again after the cans are removed from the retorts and readied for the labeling operation. Due to the tropic location of the plant, with its extremely high relative humidity, air conditioning of the packing room is required for worker comfort.

The Star-Kist people were very satisfied with the Vilter installation. They were particularly pleased with the draft-free air conditioning of the packing room and the uniform temperature maintained throughout the entire area.

Why not see your nearest Vilter distributor or write Vilter direct for helpful advice on your vessel, or shore plant cannery refrigeration needs.

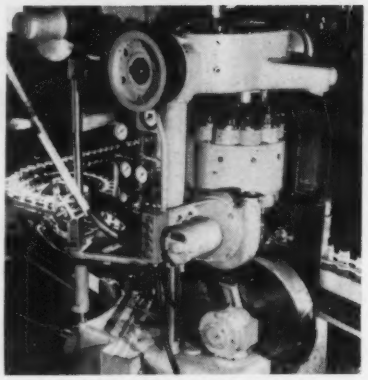
Engineered, sold and installed by VILTER DISTRIBUTOR
Eugene P. McDonald Inc., Mayaguez, Puerto Rico.

Vilter® refrigeration air conditioning

Vilter Manufacturing Corporation
Milwaukee 7, Wisconsin

Air Units • Ammonia and Freon Compressors • Two-Stage and Booster Compressors • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice Machines Liquid Transfer Systems Air Agitated Ice Builders

Write for helpful bulletins to Vilter Manufacturing Corporation, Dept. E-617 2217 South First Street Milwaukee 7, Wisconsin



NEW HIGH-SPEED CAPPER, being developed by General Packaging for White Cap Div., is capable of applying vapor-vacuum caps to bottles at rate of 1000/min.

Top priority has been given to an economically feasible electric welding method of manufacturing endless lengths of tubular tinplate or aluminum can bodies at very high speed. Tubes are then fabricated into cans. Cans are welded from coil-stock at speeds of 1,000 ft./min. Translated into 12 oz. beer cans, for example, means that production method could produce cans at rate of 3,000 cpm.

Customizing metal cans to a variety of shapes, without slowing down the production line, is also in an experimental stage.

Single largest program at Metal R&D is the development of lightweight tinplate containers. Beverage section is testing 60-lb. plate for carbonated beverages.

Advances in manufacture of aluminum cans and reductions of base weight of aluminum ends are underway. Containers constructed of composite materials (plastics, aluminum foil, and paper laminates) are also being developed.

A new concentrate juice can is being tested. Spiral wound container is made up of composite structure of supporting kraft paper (.009 in. thick) with foil (.00035 in.) on both sides and metal ends. It's about 25% cheaper than metal. Inside foil layer is vinyl coated, outside is lithoed.

First special feeding containers for human use on prolonged space flights have been designed and will be produced by CC. Body of metal space feeding container resembles standard six-oz. citrus concentrate can. Both ends are made to permit easy, efficient removal and plastic piston is incorporated inside and at the bottom to aid in food dispensing in a weightless environment. (End)

Old King Cole is a merry old soul
And no wonder he feels that way
The foods and the cheeses that fill his bowl
Keep fresh with SORBISTAT®-K!

FOODS STAY FRESH and "fit for a king" far longer when protected with SORBISTAT-K (potassium sorbate, Pfizer). This safe, efficient inhibitor of mold and yeast growth has little or no effect on the taste, and is proving highly successful in a variety of modern food products.

Some examples: fresh fruit cocktails ▫ high moisture cake ▫ cake fillings and icings ▫ fruit pie fillings ▫ cheeses ▫ fountain fruit syrups ▫ chocolate syrups ▫ prepared salad ▫ pickles ▫ dietetic jams and jellies ▫ smoked and pickled fish ▫ wine ▫ dried fruits.

SORBISTAT-K is readily soluble in water. You can prepare up to 50% solutions for sprays, dips and metering.

FOR APPLICATIONS WHERE WATER SOLUBILITY IS NOT A FACTOR Pfizer now offers new, improved SORBISTAT® (sorbic acid, Pfizer). SORBISTAT is a free-flowing product that dissolves readily in oil and fat media and can be mixed easily in dry form with other dry food ingredients. It has an extremely low moisture content.

Please send me Technical Bulletin #101, "Sorbistat®—Sorbistat®-K" FE

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Science for the world's well-being

Quality Ingredients for the Food Industry for Over a Century

Pfizer

Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N. Y.

Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.; Montreal, Canada

MATCHING ads to audience interest is credo of Miller's E. G. Ball, left, shown checking copy of proposed layout with ad agency representative.

Outflanks Bigger Rivals With 'Editorial Ads'

Miller Brewing puts quality image across with customer slanted appeal that keeps sales foaming ahead

WHAT DO YOU DO when competitors spend five times as much on advertising as you do? That was the problem Miller Brewing faced not too far back.

The brewer's successful answer: High-style ads that "out attract" competitors' offerings. This it did with an editorial approach—tailoring advertising to the magazines in which it appeared with copy themes relating to consumers' personal interests.

Director of Sales Promotion Ed. G. Ball puts it this way: "We use specific ads for specific readers of specific magazines. People buy a magazine primarily for its editorial content. It seems logical to have, in a sports magazine, a sports type ad that a man would be interested in reading. To reach women through a fashion magazine, we use ads with fashion appeal."

Has this editorial approach proved successful? Miller says yes, claims its ads consistently outscore rival versions in readership tests.

Extra Bonus

The editorial-ad approach has produced a helpful side-effect. It's the impression created among the trade that the company does more national advertising than in reality. (Only about 15% of its ad budget is divided among 24 national magazines.) Ball says a survey among its distributors showed, on the average, they felt the company was spending twice what it actually was.

Company's policy grew out of the need to set Miller apart, to make limited budgets create an impact and higher impression. To achieve this, brewer did some painstaking advance planning. Studied were market trends, changes in buying habits, shifts in outlets, trends in income and consumer wants, growing importance of middle- and upper-middle income groups, package changes, and how distributors operate. Next was a media study to see where limited funds would deliver maximum value.

Keynoting firm's ad program is balance — using all types of ads in proper proportion. These cover the careful selection of media, too.

Another element is consistency —telling the Miller story in a high-style approach to set it apart from other breweries.

As changes occur in the field, company keeps in mind the essential fact that "Miller High Life" is the one nationally distributed beer with one plant, selling at a premium price in a clear glass bottle. This special character (uniqueness) is maintained by advertising.

(Turn page)

JOHN V. ZIEMBA, Senior Associate Editor, "Food Engineering," Chicago

Naturally, adjustments have to be made. Take, for example, the recent trend towards packaged beer. It's off-premise purchase by women has materially affected beer advertising. Miller adapted itself to this situation and, in many ways, pioneered advertising slanted to this new market.

Generally, restrictions to package copy are self-imposed by the brewer. A strong believer in good taste, Miller won't show a woman drinking beer or associate Santa Claus with beer. Nor will it employ cartoon-type ads likely to appeal to the younger set.

Company says that proof its advertising is striking home is the fact that its competitors have been jumping on the "quality bandwagon."

More 'Seed' Money

Miller's ad budget bears a relationship to its anticipated sales volume (in barrels). And the firm says it's substantially more per barrel than most of its competitors.

Miller's merchandising program has perked up noticeably. Back in '41, outlay was $500,000. When the company went completely national in '52, ad budget had climbed to $4½ million. This year, brewer plans to spend close to $6-mill.

Present breakdown runs something like this: National magazines, about $1 million; outdoor ads, $600,000; local campaigns in key market areas, $3 million; trade papers, $125,000. Rest goes to other promotional and merchandising material.

Miller doesn't have ad allowances. Its distributors contribute voluntarily (roughly around $1 for every $3 put up by Miller).

Greater part of the budget and activities is presently directed toward an "in-market effort." Object is to concentrate more heavily in market areas pre-selected by the sales department. Reasons are the increasing tempo of competition and the need for stronger local impact.

Here, local programs are planned by studying local marketing conditions, competition, media costs and values, themes, etc. Developed, then, for the necessary impact was Miller's CCC (concentrated, coordinated campaign) concept for the use of in-market advertising funds in the sales-selected markets over a planned period. Along with CCC's timing and theme, national ads are coordinated with merchandising efforts on "food and Miller High Life."

How Ads Are Slanted

Brewer's ads focused on community pace-setters, tie beer to the good life by associating with today's demand for finer foods, cars and homes. This way, ads give beer style so hostess won't apologize for serving it.

When the company began shaping the Miller image, these five distinctive series of ads were adopted:

1. **Mass Appeal**—an "all walks of life" series, with the slogan "Enjoy Life With Miller High Life" aimed at widespread groups.
2. **Prestige Appeal**—a high-style series targeted at growing income groups. Used, here, was the "Champagne of Bottle Beer" slogan. Ads were run in "prestige" magazines, with ideas accenting young families at moments of enjoyment in fashionable settings.
3. **Woman's Appeal**—for high-fashion magazines, anticipating a growing trend of beer purchases by women.
4. **Sports Appeal**—aimed at sportsmen with "The National Champion of Quality" theme. Ads spotted in sports, outdoor and fraternal magazines, featured leisure pursuits (sports and recreation) and food snacks (popular with sportsmen) alongside beer.

Today's national effort comprises a 3-phase magazine program:

. . . Food and Young Couple Series—innovated to capture a greater share of the home-consumption trend and employed as a highly successful sales promotion tool. Illustrated are attractive couples in pleasant surroundings with good looking foods that go with beer.

Ads like these are especially geared to food stores to sell more higher priced foods. And they're valuable to Miller sales and merchandising men calling on restaurants, food, and beverage stores

. . . Scratchboard Series—used in sports and men's magazines to capture the imagination and increase the Miller image of quality among sportsmen.

. . . All-Type Series—such as a "reasons why" sales story. Examples are answers to titled questions like: "What Is a Milwaukee Beer?" "Why Is Miller High Life Brewed Only in Milwaukee?" and "Why Measure Your Pleasure in Pennies?" (End)

FOR A PERFECT RECORD OF RETORT PROCESSING

Hang a Cook-Chex tag on every basket before it goes into the retort and eliminate all guess-work when it comes out of the retort. On each Cook-Chex tag, a **chemically impregnated circle** turns from purple to green, to provide infallible proof of proper and complete "in-can" processing. Cannery inspectors approve and recommend Cook-Chex. Major packers all over the world use them to:

1. Eliminate wrong cook schedules.
2. Guard against "by passing" retorts.
3. Warn of any failure in retort processing.
4. Keep retort baskets in sequence.
5. Provide low-cost permanent records for cooking plants.

The cost of Cook-Chex protection is negligible . . . less than one cent for 75 cases of No. 300 cans.

SEND FOR FREE TEST SUPPLY TODAY

You'll receive a generous supply of Cook-Chex at no cost; send your name, title, and plant address to Dept. FE-10.

ATI **Aseptic-Thermo Indicator Company**

11471 Vanowen Street • N. Hollywood, Calif.

CIRCLE 99 ON INQUIRY CARD

FLAVOREX

Jamaica Style

RUM FLAVOR

...puts the "YUM" in your product!

• Delight the palates of young pirates and their parents by adding Flavorex Rum Flavor to your product. Great for a *hearty accent!* Exquisitely exotic as an *extra touch of flavor!*

• Use Flavorex Rum Flavor in *baked goods, confections, puddings, eggnog mixes, ice cream,* and other foods. You'll be doubly rewarded these ways . . . perfect for your present formulas . . . helps earn consumers' preference for your product.

• Flavorex Jamaica Style Rum is a flavor concentrate of natural and synthetic esters produced in our own plant and blended by our masters of the art. Run a batch test. You'll discover that every fragrant drop adds mellow tropical sunshine to your product. Write for free sample, or place a trial order today.

Rum Flavor No. B224 . . . $12 per gallon

Better Flavors for Better Products

FLAVOREX CO., INC.

302 S. CENTRAL AVE., BALTIMORE 2, MD.

n & Companies

Gordon W. Ryan

Elected GM V.-P. . . . Gordon W. Ryan, director of sales for General Mills' Grocery Products Div., has been elected a v.-p.

Mr. Ryan has been affiliated with GM's Grocery Products Div. since '40 when he began his career in merchandising and sales, progressing from district sales assistant to supervisor and, in turn, to district and regional sales management responsibilities in the Philadelphia, Buffalo, and Providence areas.

Previously serving as v.-p. and general manager of firm's Canadian operation, General Mills Cereals Ltd., Mr. Ryan supervised introduction and distribution of a wide variety of General Mills products.

He returned to Minneapolis in '60 to take the post of central sales manager for Grocery Products Div., becoming divisional director of sales in '61.

Charles A. Tucker

Heads Frenchette . . . Charles A. Tucker has been appointed president of Frenchette, Carter Products' low calorie foods div.

Appointment was made in recognition of the increasing importance of the division. While no new products are now being announced, the company has begun an intensive development program to broaden the Frenchette line of low calorie foods. Firm currently markets Frenchette and Frenchette Italian style salad dressings.

Prior to joining Frenchette as general manager in '59, Mr. Tucker was general sales and advertising manager for The S.O.S. Co.

Robert L. Lozon

Glidden Ups Lozon . . . Robert L. Lozon has been boosted to purchasing and trade relations v.-p. at Glidden Co.

Mr. Lozon joined Glidden in '33 in the trade sales department of the Paint Div. Subsequently he served as a buyer in the purchasing department until '42. He returned to the company in '46 as a buyer and served in that capacity until his appointment as general purchasing agent in '57.

The following year he was named director of purchasing and trade relations.

Personnel

Harold K. Wilder has been appointed managing director of Food Industry Assn. Executives.

Dr. O. J. Kahlenberg, one of the nation's outstanding authorities on eggs and egg products, has been appointed research director for Seymour Foods Inc., Topeka.

A. J. D. Smith takes over as director of Sunkist Orange Products Div. of Sunkist Growers.

Gene Tate joins Pacific Hawaiian Products Co. as product planning manager.

Joseph E. Guinane, assistant to the general man-

ager of General Foods' Birds Eye Div., retired after 35 years service. Mr. Guinane was a pioneer in the frozen food industry and a co-founder of the Birds Eye brand.

B. E. Bochmann, manufacturing v.-p. at Penick & Ford Ltd., Inc., moves up to directorship of company.

Robert L. Kress takes over as product marketing manager—special products, at Campbell Soup Co.

Walter A. Moore has been appointed staff v.-p. of Corn Products Sales Co.

Chester B. England has been boosted to president and chief executive officer of Ward Baking Co.

Dr. Wallace C. Lawton has been elected second v.-p. of International Assn. of Milk and Food Sanitarians.

Paul D. Hursh and **George F. Atkinson** move up to v.-p. posts in Glidden's Co.'s Durkee Famous Foods Div.

Dr. Clell B. Hartley has been appointed director of quality control and R&D at Curtiss Candy Co.

Paul V. Rea is new president of United States Products Corp., west coast canning unit of Consolidated Foods Corp.

John T. Ryan Jr. and **William P. Snyder III** have been elected to the board of H. J. Heinz Co.

Roy N. Nevans has been boosted to sales v.-p. at Henningsen Foods Inc.

Clay A. Walker has been named consumer sales manager of Sunkist Growers' product sales dept.

Douglas E. Frey is now sales manager for Salada-Junket Div. of Salada Foods.

Chester B. England has been elected president and chief executive officer of Ward Baking Co.

J. Lucian Smith, former Coca-Cola field sales manager, bottler sales, moves up to company v.-p.

William L. Blaser, president of EverSweet Corp., will now also serve as president of Barra Frozen Foods.

Industry

Borden Co. plans purchase of properties and assets of **Greenwood Foods Inc.,** Waterloo, N. Y. packer of red cabbage and pickled beets, and handler of glassed spiced fruits.

National Dairy Products Corp. will purchase assets relating to fish business of **Green's Products Ltd.,** largest canners and distributors of tuna fish and salmon in Australia.

The Quaker Oats Co. and **Burry Biscuit Corp.** have approved terms of transaction whereby Burry's assets would be acquired by QO. Agreement is still subject to approval by Burry stockholders.

Beech-Nut Life Savers Inc. reports that acquisition of **Joseph Tetley & Co. Ltd.,** well-known London tea house, has been approved in principle by both boards.

Southern Bakeries Co. picks up its 20th plant with purchase of **Cake Box Packaged Products Inc.,** Kansas City.

Seabrook Farms Div. of Francis H. Leggett & Co., a wholly owned subsidiary of Seeman Bros. Inc., has signed a sales and marketing agreement with **N. Kilvert & Sons,** Manchester, England, whereby English firm will exclusively distribute Seabrook products throughout United Kingdom.

Armour & Co. has arranged for purchase of business and properties of Food Specialties Inc., Worcester, Mass. makers of widely sold "Appian Way" brand pizza mix.

The Frito Co. completed plans for purchase of **Made Rite Potato Chip Co., Fall River, Mass.**

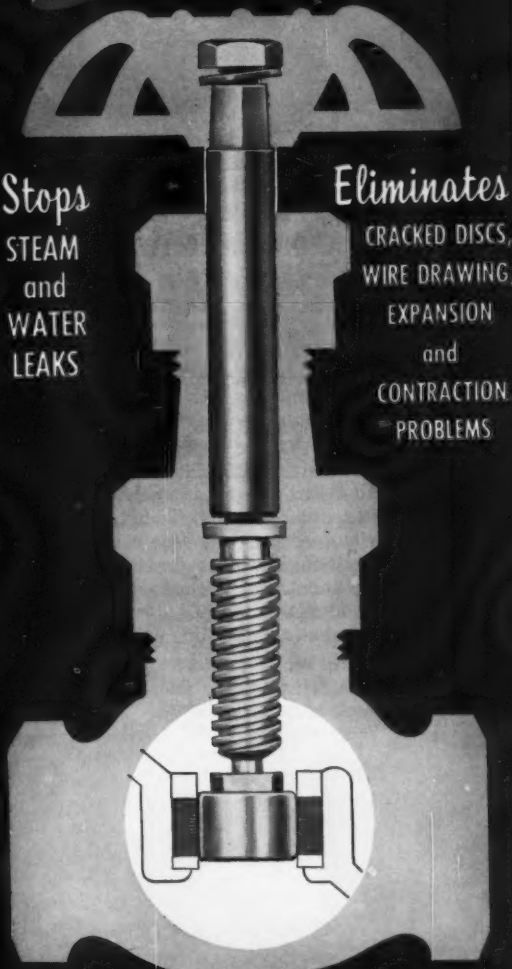
Falstaff Brewing Co. purchased malting and other physical properties of **Albert Schwill & Co.,** Chicago.

Nalley's Inc., will acquire all outstanding capital stock of **F&L Food Prod-**

Dairymen!

Here is a Valve Designed Exclusively for YOU!

by Strahman



A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.

Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.

Write direct for complete catalogue

STRAHMAN VALVES, Inc.

NICOLET AVE., FLORHAM PARK, N. J.

THEY PUT IT IN A PACKAGE
AND CALLED IT

MUELLER'S MACARONI

That was fifty-seven years ago. Mueller's has been a leader ever since. And one good reason for the prominence of Mueller's Macaroni brand has been the skill and efficiency that has always characterized Mueller's methods of protecting its product with a well designed package.

In 1949 Mueller introduced its windowed cartons and installed Pneumatic coordinated equipment to form, fill and seal its packages—automatically. Today, in addition, it operates a Velocitron combination (see below). This single machine handles all of these operations at highest speeds and "lower cost per container"—the closest thing to packaging automation available today.

If you, too, are interested in the very latest automatic packaging or bottling techniques, Pneumatic can offer you more—in equipment, experience and service—than any other company you could consult.

PNEUMATIC SCALE CORPORATION, LTD., 91 Newport Ave., Quincy, Mass., New York; Chicago; Dallas; Rochester; Toronto (Delamere & Williams Co., Ltd.); Los Angeles, San Francisco, Seattle (Fred Todt Company); London (Rockwell Pneumatic Scale Ltd.); Paris (O. R. M. A.)

ucts Co., Colorado Springs, and its wholly-owned subsidiary **Colorado Potato Flake & Manufacturing Co.**, Denver.

The National Brewing Co., Baltimore, purchased all assets of the Miami plant of **Anheuser-Busch Inc.** for over $3 million. A-B was forced by Federal govt. to sell plant on basis of Clayton Antitrust violation.

Associated Industries

Thomas C. Fogarty

CC Boosts Fogarty . . . Thomas C. Fogarty, president of Continental Can Co., has been designated chief executive officer, succeeding General Lucius D. Clay who was appointed Pres. Kennedy's personal representative in Berlin.

Mr. Fogarty has been president of Continental since '56. He was elected a v.-p. in '46, and executive v.-p. of the Metal Div. in '50. He has been a member of the board since '51.

Owens-Illinois Glass Co. and National Distillers & Chemical Corp. have formed a new, jointly-owned company, **National Petro Chemicals Corp.**, for manufacture of blown plastic bottles and other rigid-type polyethylene products.

Thatcher Glass Mfg. Co. completed movement of its plastic tube plant from Nashua, N. H. to Muscatine, Iowa.

R. T. Flaherty, Film Products Group of Minnesota Mining & Mfg. Co., has been appointed chairman of packaging standards committee of the Modern Foods Council. He will be in charge of efforts to establish acceptable industry standards for flexible and rigid plastic containers for packaging heat-in-pouch foods to assure proper performance of packages.

J. Whitney King takes over as general manager of Custom Packers, a new Division of American Can Co.

Kaiser Aluminum & Chemical Corp., Trentwood, Wash., has completed a major, fully-automatic facility to process aluminum sheet and coil for can manufacturing industry.

Lily-Tulip Corp. starts construction of a new 900,000-sq. ft. plant at Holmdel, N. J., for manufacture of paper cups and containers.

Hyster Co. has named Philip S. Hill to presidency, succeeding Ernest G. Swigert who becomes board chairman and chief executive officer.

COLOSSAL CANS lined up along wall of the Jos. Schlitz Brewing Co. in Tampa, Fla., are tourist eye-catchers. Forty-five ft. high and 20 ft. in diameter, they are utilitarian as well as thirst-suggesting, being grain elevators each with a capacity of 13,650 bushels.

new equipment & supplies

Dispenses, Fills, Seals Rigid Plastic Containers

An automatic machine dispenses, fills, and seals formed-plastic containers of all shapes. Packages may be square, rectangular, round, oval, and compartmented.

Packaging speeds on the machine (Formline) range 6-100 containers per min. Speeds up to 600 per min. are obtained on custom models. Tear tapes for opening covers can be automatically applied. — *Formed Container Corp., Orangeburg, N. Y.*

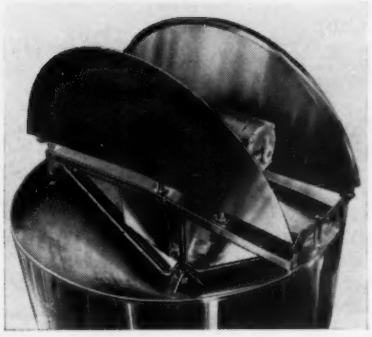
Circle 401 On Inquiry Card

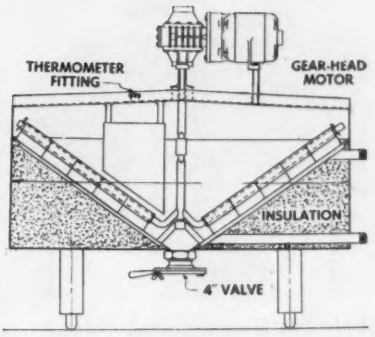
Plastic-Lined Steel Drum

Combining the corrosion resistance of polyethylene with the strength of steel, this 55-gal. drum provides an inert lining surface and a strong outside covering.

The non-breakable polyethylene liner is removable for cleaning ease and emptying of contents, or it can be used separately from the steel overpack. Drum is closed with a tightly fitting polyethylene cover and sealed with a bolted steel closure ring.—*Redmanson Corp., York, Pa.*

Circle 402 On Inquiry Card





Dual-Purpose Vessel Saves Time, Labor

Processing time and expense may be cut with use of the above vessel, which permits mixing and successive cooking and cooling in the same unit. Practically any pourable product can be processed at temperatures ranging from 212-40 F., or lower.

Illustrated unit (Cooker-Cooler) is an atmospheric-type vessel. Another model is available for cooking and cooling under vacuum or pressure. Latter design enables discharging a product by air pressure without incorporation of air, rather than by pump or gravity flow. Either unit is well adapted to thawing of frozen foods and for handling products whose high starch content make pumping difficult and gravity flow impossible.

Advantages cited for the units:

1. Shorter cooking and cooling time because of high heat-transfer efficiency and positive agitation, also lower heating and coolant costs.
2. Elimination of handling between load and unload, and uniform cooking through controlled agitation that curbs product damage.
3. Quicker product cooling, improved sanitation, and straight-line production.

Typical applications include cooking and cooling soups, stews, fruits and vegetables, pastry filling and frostings, jams and jellies, creamed or sauced products, candies, and baby foods.

The Unit is essentially a covered conical pressure - wall tank with centrally located outlet at bottom. Inside the tank is a vertically mounted scraper-type agitator, with removable blades of long-lasting synthetic material. A 2-speed, top-mounted motor drives the agitator, which also provides efficient scraping action to dislodge viscous material.

Either hot water or high-velocity steam is circulated through an insulated pressure jacket (tested to 150 psi.) which surrounds the tank. For cooling, cold water is circulated through the same jacket. Efficient agitation and heat transfer enable processing of products at just a few degrees higher or

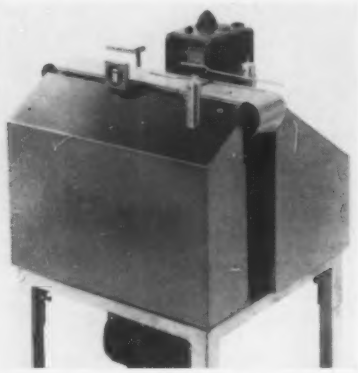
SERVICE CENTER

Sanitation 112
Ingredients 114
Catalogs 116
Books 122
Patents 124
Advertisers Index 126
Classified 128
Reader Inquiry..Back of Book

lower than the heat transfer medium.

Vessels are entirely of stainless steel, except for the legs. A variety of commercial sizes is available.—*Chester-Jensen Co., Chester, Pa.*

Circle 403 On Inquiry Card



Rejects Underfilled Packs

Compact and efficient, this underweight package rejector handles closed containers up to 7 lb.

Called Model UWR-1, it accomplishes 100% rejection within an accuracy tolerance established by line speeds and product characteristics. As packages flow across the machine, a flipper discharges underweight units off the Mylar carrier belt. Speeds up to 300 packages per min. are reported.

Unit measures 24x24 in. Height is adjustable. All electronics are solid state, in a plug-in unit located in the weigh cell.—*Illumitronic Systems Corp. Sunnyvale, Calif.*

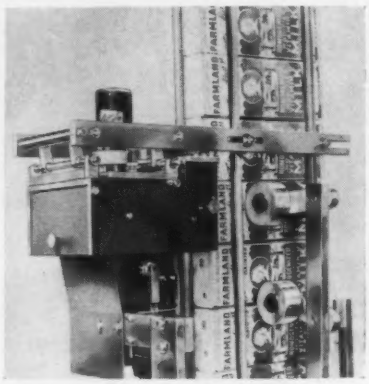
Circle 404 On Inquiry Card

Polyester Conveyor Belts Spliced Ultrasonically

Oriented polyester belts spliced ultrasonically offer high strength and dimensional stability for power - transmission and conveying applications.

Belts of Mylar are available in any length and in widths to 60 in.—*International Ultrasonics, Inc., Cranford, N. J.*

Circle 405 On Inquiry Card



Date-Price Imprinter

Designed specifically for attachment to "Canco" milk-carton machines, this imprinter applies dates, codes, and prices to top of carton during filling.

Imprints, which can be placed anywhere on carton top including the rim, are made as stack of cartons travels down the vertical feed track. A starwheel attached to imprinter moves the cartons. Unit needs no attention during operation

(Continued on page 106)

Speed up your production by using the

Photo courtesy Rheem Manufacturing, Container Division

BALCRANK STAINLESS STEEL

air-operated Reciprocating Transfer Pump

Picture shows Original Crispy Co., Bronx, New York, transferring Pizza Sauce using BALCRANK P-161 STAINLESS STEEL PUMP from Sterilpac Container manufactured by Rheem Mfg. Company, Linden, New Jersey.

After removing drum head, using a Wizzard Drum Cover Opener, the 55 gallon container is pumped empty in 3½ minutes.

BALCRANK MODEL P-161 STAINLESS STEEL Pump with Drum Clamp transfers all concentrates of Tomato Paste, 26% to 36%, Peach and Pear Concentrates, Pizza Sauce, Ketchup, All Fruit Juices, Vegetable Oils and liquid food products.

Pump is light in weight, will out-perform conventional method of emptying #10 cans by two-to-one production ratio.

Distributors wanted.

Wire or write Balcrank Inc., Cincinnati 9, Ohio, for literature and prices.

BALCRANK, inc. 10 Disney Street, Cincinnati 9, Ohio

flavor by Webb

Tropical coconut is one of the many flawless, synthetic food flavors by Webb. It is available in several liquid forms, and spray-dried, to suit all applications. For samples, and information about any of the Webb specialty flavors (such as coconut, banana, pineapple), or the wide variety of standard flavors, please call or write Webb. Food flavor specialists for over 50 years.

R. D. WEBB & CO., INC

STIMPSON AVENUE AND STILES STREET, LINDEN, NEW JERSEY

and can be set up and maintained by any floor attendant.

Fully-enclosed imprinter uses instant-drying flexographic ink specially made to adhere to waxed and other coated surfaces. Data are quickly changed by a unique interchangeable type roll (Metalok). Built-in controls automatically compensate for any normal-length variations of cartons.—*Adolph Gottscho, Inc., Hillside 5, N. J.*

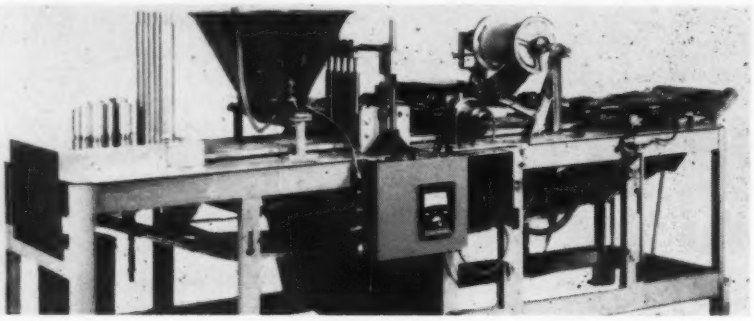
Circle 406 On Inquiry Card

3-Way Switch Curves For Conveyors

Versatility of conveyor systems may be increased with use of new flexible roller-curve units for switching items onto spur lines left, right, or straight ahead.

Various models permit three-way, 'Y,' or spur switching. Units connect to gravity or power conveyors and are operated either by hand or motor. Curve units are for 12-, 18-, or 24-in. conveyors.—*Rapids-Standard Co., Grand Rapids, Mich.*

Circle 407 On Inquiry Card



Fills, Seals One-Portion Aluminum Foil Containers

Reportedly the first commercial machine for filling and hermetically sealing pre-formed, one-portion aluminum foil containers, this unit operates at speeds to 240 containers per min.

Designated UCS-30, it packages in increments of ¼ oz. jelly, syrup, honey, and dessert toppings in containers sized from ½-2 oz. Sealing materials used are plain or laminated aluminum foil, coated with heat sealants and usually printed or decorated. A pull tab allows easy removal of the cover.

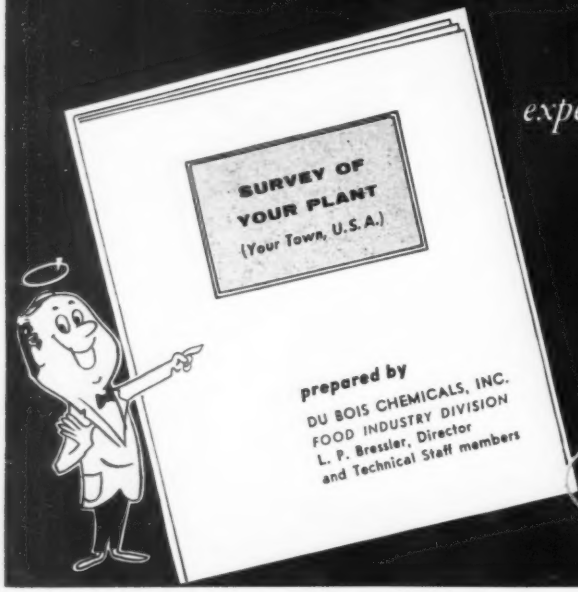
Unit is available on rental terms based on volume processed. Specification: Table height, 33-¾ in. plus filler unit; width, 33-⅝ in.; length, 119 in.; temperature range, 350-390F.; power, 220 v.; 3-phase motor. — *Ekco - Alcoa Containers Inc., Unit Container Div., Wheeling, Ill.*

Circle 408 On Inquiry Card

(Continued on page 108)

A DuBois Chemicals FOOD PLANT SURVEY CAN CUT YOUR CLEANING COSTS

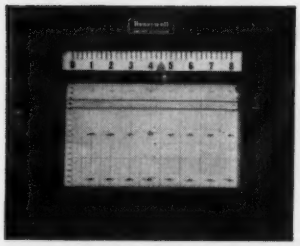
Write today . . . Learn the facts!
expert appraisal without obligation



It costs you nothing to learn the true efficiency level of your present maintenance and sanitary programs. A DuBois on-the-spot survey may provide the answers to: 1—Automation and how it fits your picture; 2—More efficient use of labor; 3—How to achieve improved levels of cleanliness; 4—Overall cost reduction. Learn the facts first hand, then evaluate them for yourself. Write today on your letterhead.

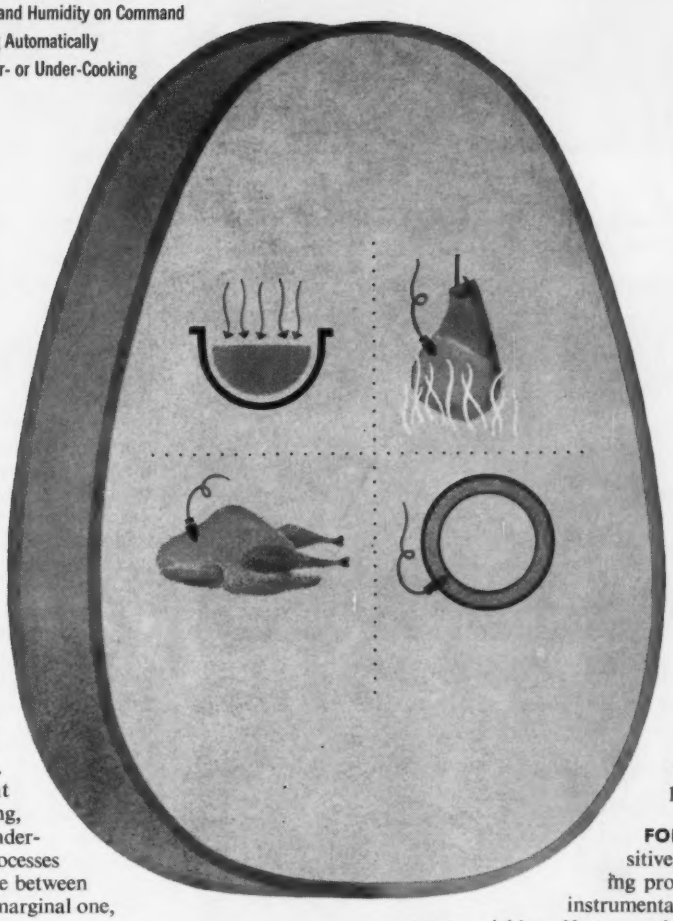
DuBois Chemicals

DuBois Chemicals, Inc.
Cincinnati 2, Ohio



Honeywell complete food processing instrumentation

- Automatic and Simultaneous Blending
- Smokehouse Temperature and Humidity on Command
- Rare to Well-Done Roasting Automatically
- Dry Rendering without Over- or Under-Cooking



BRINGS OUT THE BEST IN YOUR MEAT PRODUCTS

Instruments are a meat packer's best friend! Properly designed and applied, they can bring new quality, new profits to all his meat products. Precise measurement and control of blending, smoking, roasting, rendering, and other meat processes can mean the difference between a healthy profit and a marginal one, or none at all.

With Honeywell instrumentation guiding the process, there's nothing left to chance. From the world's most complete line of automatic controls, Honeywell furnishes individual instruments and custom-designs complete systems to regulate virtually every meat processing operation.

FOR AUTOMATIC BLENDING. Honeywell Computer Blending Systems automatically control formulating of sausage, frankfurters, lunch meats, and other blended meat products. Basic mix formulas are solved in a matter of seconds and recorded on punch cards for programming the blending system to simultaneously and automatically blend all ingredients.

FOR SMOKEHOUSES. By automatically controlling smokehouse temperatures and humidity, Honeywell instrumentation cuts processing time and heating costs, eliminates fire hazards, and protects product quality.

FOR RENDERING VATS. The sensitive, accurate control of dry rendering processes provided by Honeywell instrumentation results in consistently higher process yields and better product color and keeping properties.

FOR ROASTING. Honeywell electronic oven controls effectively reduce meat shrinkage by providing end-point control of internal meat temperatures. With Honeywell's *Sabrecouple* thermocouple inserted in the roast and connected to a control alarm system, the chef is able to cook the roast to the desired standard of taste—rare to well-done, automatically!

Your nearby Honeywell field engineer will be glad to discuss all your instrumentation requirements. Call him today. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

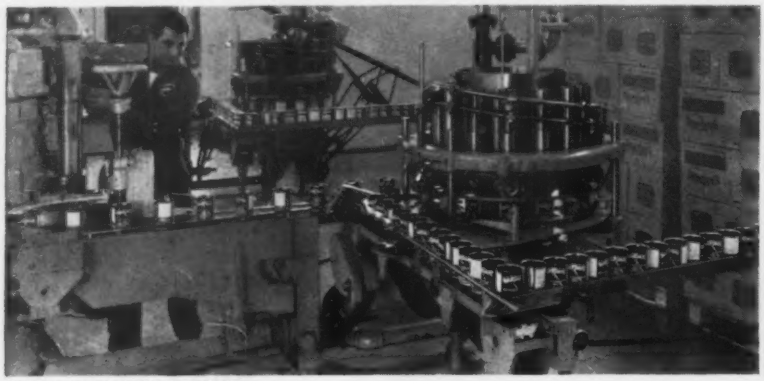
Honeywell

First in Control

SINCE 1906

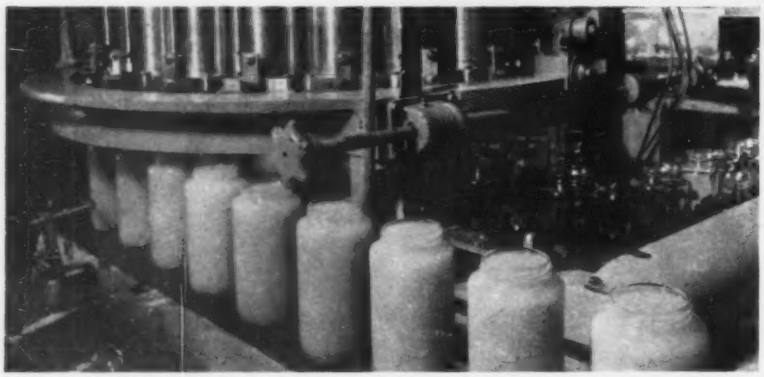
HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

FLUIDICS* AT WORK



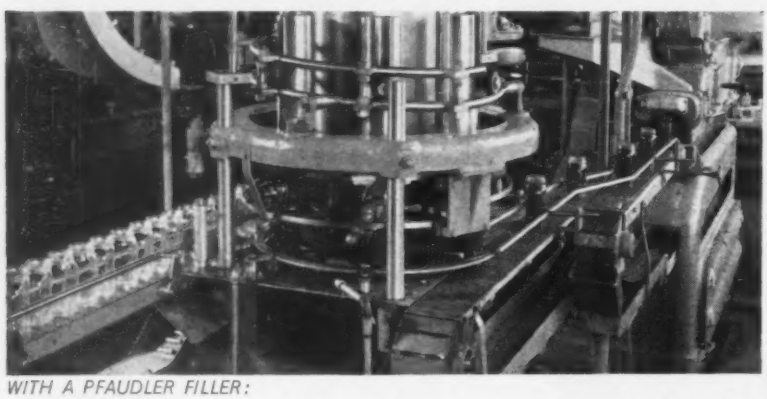
WITH A PFAUDLER FILLER:

NO MAINTENANCE or parts replacement in two years at Bardahl Lubricants Inc., where two Pfaudler® Rotary Piston Fillers handle a variety of viscosities and container sizes.



WITH A PFAUDLER FILLER:

CONTROLLED "HEAD SPACE" every fill is what Duffy-Mott gets while handling 190 quarts of applesauce every minute. Accuracy is held to ±1/10 fluid ounce.



WITH A PFAUDLER FILLER:

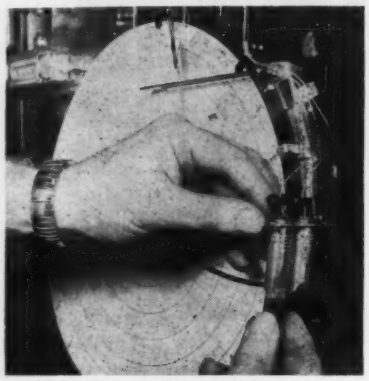
VISCOUS HOT FUDGE is filled with speed and accuracy at the Robert A. Johnston Company. Six- or eight-ounce jars are filled at the rate of about 55 a minute.

More information? Write to Pfaudler Division, Dept. FE-101, Rochester 3, N. Y. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

Equipment & Supplies



New Ink Cartridge Cuts Recorder Servicing

This disposable ink - cartridge marking device reportedly cuts service costs and improves recording reliability.

Readily adaptable to all types of recorders, it contains sufficient ink for several months of operation. Failure to mark due to clogging of the ink flow is eliminated, since dust, dirt, and moisture that cause clogging cannot get into the system. The ink cartridge is sealed until punctured by the capillary tube when inserted for use.

The transparent plastic cartridge assures visibility of ink supply at all times. And replacement of an exhausted cartridge takes only a few minutes.—*Esterbrook Pen Co., Camden, N. J.*

Circle 409 On Inquiry Card

Oscillating Sluices for pressure-leaf filters cleans all types of filter cake from leaves up to 60 in. high in 15-30 sec. Tubular jets, mounted on a header pipe, emit a high-pressure spray.—Duriron Co., Dayton, Ohio.

Circle 410 On Inquiry Card

Facsimile Communication System provides rapid transmission of all

(Continued on page 110)

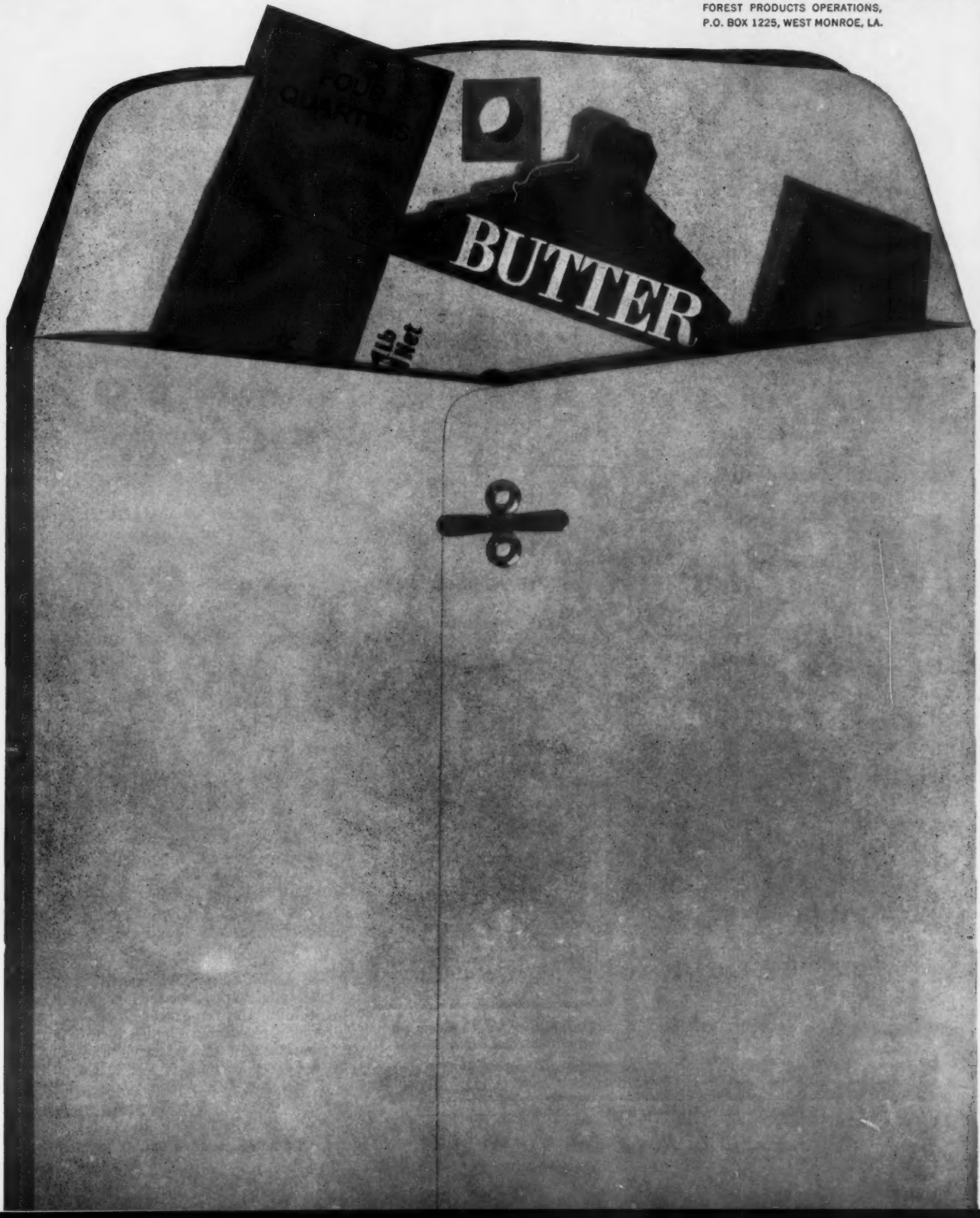
FOR MORE INFORMATION...

. . . simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

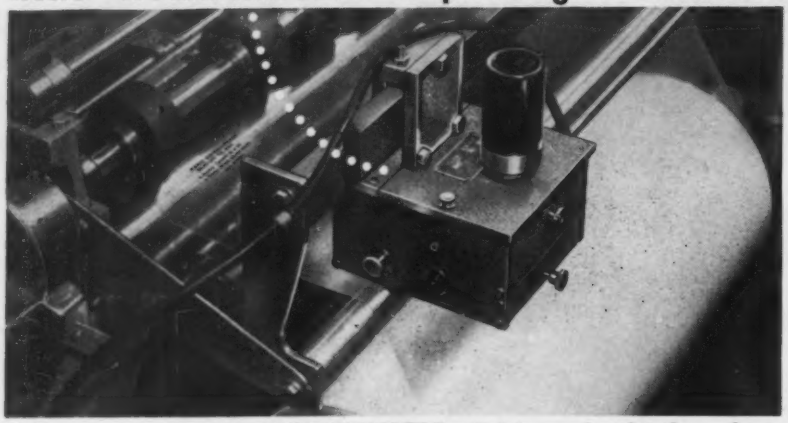
Send us your carton (even if you love it). If we can't beat it on design, printing and strength, at no increase in cost, our name isn't **Olin**

PACKAGING DIVISION

FOREST PRODUCTS OPERATIONS,
P.O. BOX 1225, WEST MONROE, LA.



No wrapping machine is complete without this little "ROLAPRINTER"® imprinting attachment



Buying a new wrapping machine? Order it with a Gottscho "ROLAPRINTER" factory-installed. Adds little cost, big advantages.

Amazing "ROLAPRINTER" unit lets you imprint the package as your products are wrapped — automatically — with no direct labor cost. Cuts packaging costs, speeds production. Has a dozen uses — for imprinting codes, prices, weights, sizes, product names, promotion specials, block-outs, even complete designs. Attach it yourself on any wrapping, bundling, bag or pouch machine. Makes good legible imprints consistently with instant-drying fluid ink. Foolproof — requires no adjusting, no attention during operation. Over 1000 in use.

For full details write for "Bulletin RIN-8"

First and foremost in automatic production-line CODING, MARKING and IMPRINTING machines

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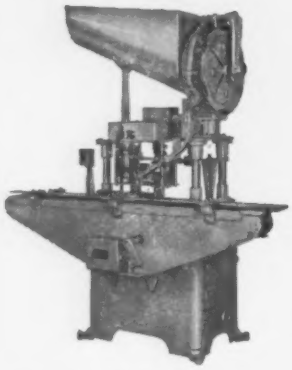
HILLSIDE 5, N. J.
Booth 519 • PMMI SHOW

CIRCLE 137 ON INQUIRY CARD

RESINA

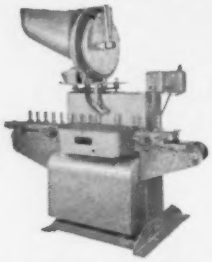
TOPS THEM ALL

fully automatic
SCREW CAPPER



The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

fully automatic
FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.
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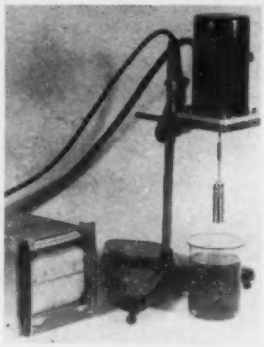
types of copy (hand-written or printed), also charts and photos. System (Scan-A-Fax) consists of a flat-bed scanner-transmitter and recorder, which are transistorized and use printed circuitry.—Fairchild Camera and Instrument Corp., Yonkers, N. Y.

Circle 411 On Inquiry Card

For the Lab



Recording Viscometer

This viscometer provides continuous direct determination and a permanent record of viscosity.

With direct reading in centipoises, unit (Rheolog) gages such non-Newtonian properties as pseudo-plasticity, plasticity, and dilatancy. Flow curves of materials that are thixotropic, rheopectic, and time and temperature dependent can be obtained. Various models (1, 4 or 8 speed) give readings from 0-64,000,000 cps. Ratio of maximum to minimum range can be as high as 80,000:1.—*Viscosel Corp., Stoughton, Mass.*

Circle 412 On Inquiry Card

Automatic Burette having only one opening to the atmosphere offers complete emptying of liquid reservoir for rapid, accurate operation. Special Teflon plug controls flow from a suspended drop to full discharge.—Scientific Glass Appartus Co., Bloomfield, N. J.

Circle 413 On Inquiry Card

Ultrasonic Cell Disrupter does not inactivate liberated enzymatic protein. Unit operates at 20 kc., employs a 70-ml. chamber, and is available in either batch or continuous-flow models.—Will Corp., Rochester, N. Y.

Circle 414 On Inquiry Card

IMITATION RASPBERRY BY FIRMENICH

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it with all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to give them greater sales appeal. Samples and technical data on request.

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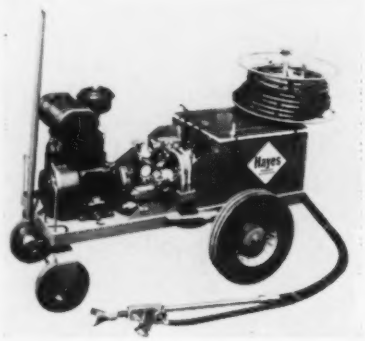


Cleans With Cold Water

This power sprayer reportedly permits efficient cleaning of equipment and plant surfaces with cold water and detergents alone. No hot water, steam, or high-pressure air are necessary, but hot water can be used with the unit if desired.

Called "Jet 500," it sprays an area of 100 ft. dia. and draws its water from any convenient source (no water tank). No chemicals pass through the water pump, which protects pump parts from corrosion. Instead, as clear water is discharged from the pump, vacuum created in an external mixing chamber siphons chemicals from a concentrate tank on the chassis. Water and chemicals are proportioned and mixed automatically for discharge.

Unit applies 10 gpm. at 500 psi., or 6 gpm. at 200 psi. It delivers 300 gal. with each full loading of chemical in the 12-gal concentrate tank. Clear rinse water is obtained merely by turning the chemical shut-off valve in the spray wand.

Overall dimensions are 60x36x30 in., weight is about 425 lb.—*Hayes Spray Gun Co., Pasadena, Calif.*

Circle 451 On Inquiry Card

New Lubricant-Cleaner For Chain Conveyors

Superior performance is claimed for an all-synthetic liquid lubricant-cleaner for use on chain conveyors.

Called "Syn-Lube," it offers maximum lubricity and cleaning power, also curbs corrosion of conveyor parts by incorporation of a special inhibitor. The liquid product can readily be used in central lubrication feeding systems. It is diluted in the ratio of 1 part lubricant to 60-100 parts of water, thus should not be used at below-freezing temperatures.

Product is available in 30- and 55-gal. drums.—*Borden Special Products Co., Tykor Div., New York City.*

Circle 452 On Inquiry Card

Latex Improves Bonding of Insulation Boards

A special latext additive for portland cement improves the bonding of polystyrene insulation boards to masonry, cured concrete, metal, or other surfaces.

Known as "Styrocrete," the latex particles increase mortar adhesion, reduce water and water-vapor transmission, and strengthen the mortar. Five gallons of additive treat 3 cu. ft. of mortar which, in turn, covers about 200 sq. ft. of board.

Low-temperature installations are cited as a particularly important application for the product.—*The Dow Chemical Co., Midland, Mich.*

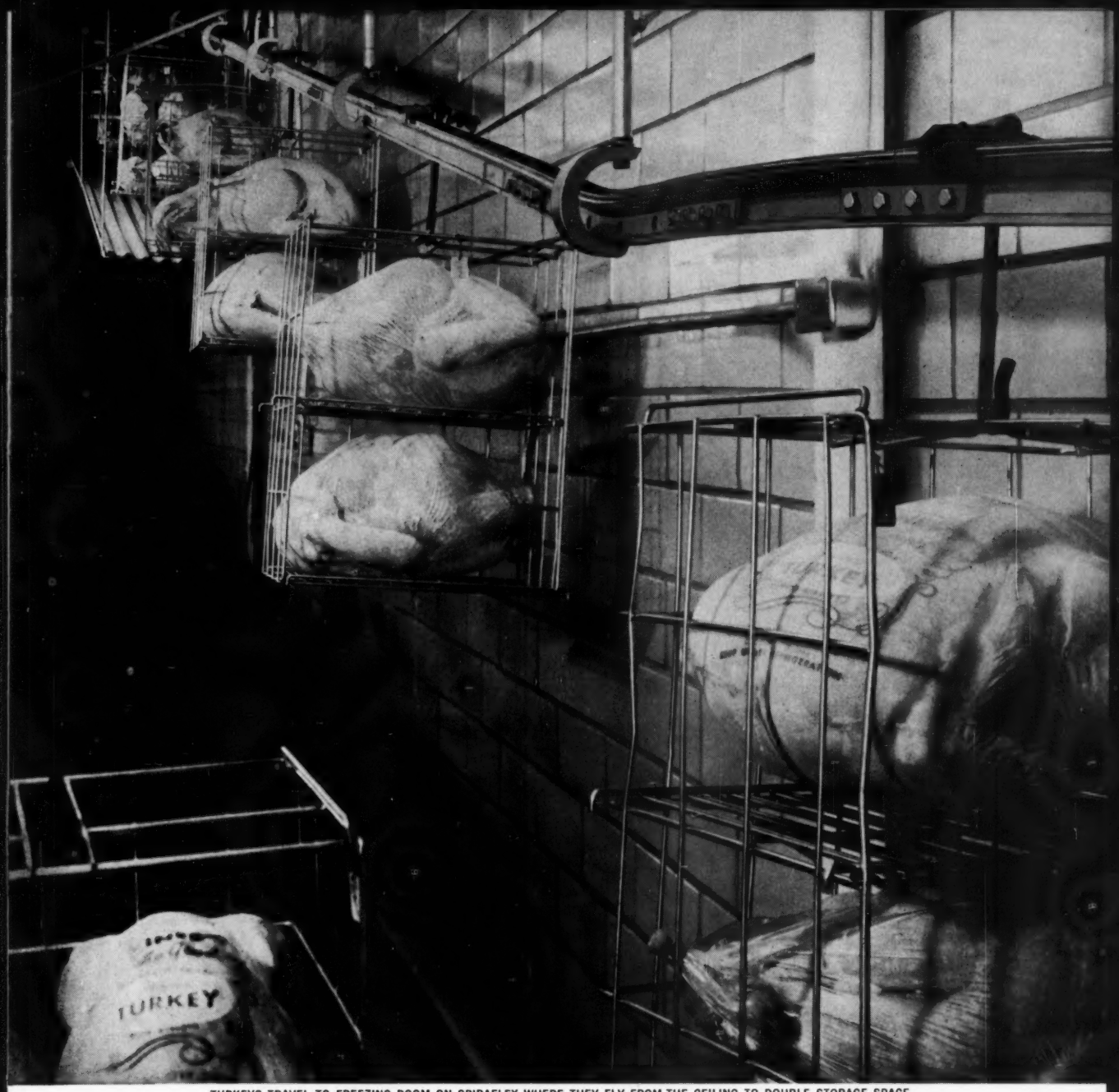
Circle 453 On Inquiry Card

Fire-Resistant Ceiling Panel offers protection against flame and intense heat for over three hours in a fire. Mineral product is quickly applied by nailing in areas where a fire-protective ceiling is required under steel bar joists. Panels are 2x5 ft. End joints are reinforced with steel bridging clips at each panel intersection.—Armstrong Cork Co., Lancaster, Pa.

Circle 454 On Inquiry Card

"High-Low" Chemical Ice Melter reportedly is equally effective at 32F. and —40F. Product (Melt) is a blend of two different ice-melting chemicals, and is easily applied by hand or mechanical spreader. Available in 10- and 25-lb. bags, and 100-lb. drums.—Chem Industrial Co., Brooklyn, Ohio.

Circle 455 On Inquiry Card



TURKEYS TRAVEL TO FREEZING ROOM ON SPIRAFLEX WHERE THEY FLY FROM THE CEILING TO DOUBLE STORAGE SPACE

Cherry-Burrell magic makes frozen turkeys fly

The wizardry of Cherry-Burrell engineers was recently challenged by Mr. Ed Vines, of Vines Poultry Company, Osgood, Indiana. He needed a continuous method of freezing his turkeys, but had limited floor space and wanted to do it economically. He investigated a number of possible methods. But they all were either too costly, or took too much room, or both. That's when Ed Vines talked turkey with Cherry-Burrell.

To solve the problem and increase his profits, Cherry-Burrell engineers put frozen birds on the wing. They recommended a Cherry-Burrell Spiraflex overhead conveying system on which to fly his turkeys through his freezing room. This gave him two rooms in one: a freezing tunnel on the ceiling; a holding room on the floor. And he needed only one refrigeration system for both. Freezing room labor, and of course, labor costs were eliminated. The more efficient use of existing equipment spread refrigeration costs over a broader base; made this money work twice as hard. And the over-all plant output was increased. Now this turkey processor's birds are quickly frozen, white, plump and profitable.

Highly trained technicians will test *your* product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing.

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A COMPLETE LINE OF CONVEYING EQUIPMENT

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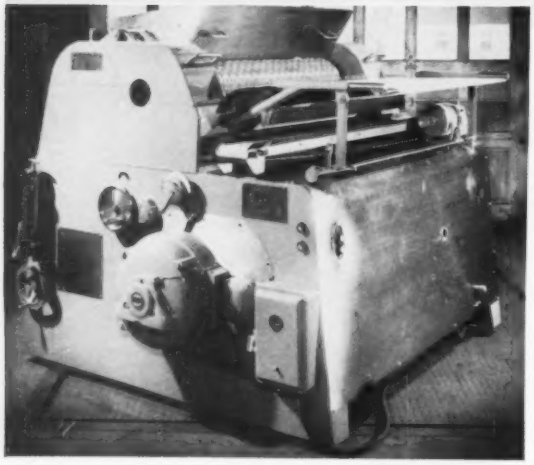

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Candy pieces and gum may be pancoated in as little as 4 hr. with use of a lactose product available in a variety of colors as well as pure white. A minimum of four subcoatings are applied in the process.

Production speed is attributed to rapid buildup of subcoatings and elimination of grossing and color steps. Moreover, free-flowing properties of the product (Lactose Edible) easily permits automating the operation.—*Foremost Dairies, Inc., Specialty Products Dept., Appleton, Wis.*

Circle 464 On Inquiry Card

New Egg-Solids Blend

Superior quality and handling advantages are cited for a blended egg-solids product used in sweetgoods formulas. Typical applications: Cakes, sweet rolls, pastries, cookies, doughnuts, and pie fillings.

Called DEB, it is blended with stabilizing carbohydrates and is available in three formulations—whole eggs, fortified whole eggs, and egg yolks.

Handling advantages include savings in shipping, labor costs, and storage space. Product requires no refrigeration, measures easily, and blends with other dry ingredients. It is packed in 50- and 150-lb. fiber drums with polyethylene liners.—*Armour & Co., Chicago.*

Circle 465 On Inquiry Card

Emulsifier for powdered egg whites (sodium lauryl sulfate) meets FDA requirements. Product (Maprofix ED) has 90% active ingredient.—Onxy Chemical Corp., Jersey City, N. J.

Circle 466 On Inquiry Card

Adipic Acid is versatile food acidulant and modifier. Nonhygroscopic product imparts lemony tartness to desserts, beverages, and candies, also improves texture of spreads, dips, and puddings.—Monsanto Chemical Co., St. Louis.

Circle 119 On Inquiry Card

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No pinholes, no blisters, no skips, globs nor thin spots occur in lining applied by this patented method. Thickness is controlled to 1/10 mil tolerance over every inch of pail interior.

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Every pail lining variable is controlled: amount of lining applied, application angle, application speed. All are invariably uniform ... and so are the finished linings. The automatic Rheem process eliminates air turbulence, human error and reduces solvent content, too.

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PLANT ENGINEERING

GAS BURNERS. Presents a full line of "complete premix" radiant type units, including design features, construction, operating principles, and advantages. 18p. —Selar Corp. of America, Dresher, Pa. **(211)**

DIRECTIONAL CONTROL VALVES. Provides data on line of 2-, 3-, and 4-way types in sizes from ½" to 3" for pressures up to 3000 psi. 15p.—The Oilgear Co., Milwaukee. **(212)**

PIPE INSULATION. "Metal-On" insulation system, an integrated type that combines metal jacketing, high temperature calcium silicate insulation, and moisture barrier in one fabricated unit is detailed.—Johns-Manville, NYC. **(213)**

FLEXIBLE METAL HOSE. Describes bronze wire braided hose containing an inner core of Teflon, including features, applications, and illustrations. 4p.—Atlantic Metal Hose Co., Inc., NYC. **(214)**

WOUND ROTOR MOTORS. Details units in sizes from 1-30 HP, designed to meet requirements of any wound rotor application, including elevators, cranes, and hoists. 4p.—The Louis Allis Co., Milwaukee. **(215)**

FITTINGS & VALVES. Four bulletins are the first published showing pictures, engineering drawings, and technical data on all of firm's 180 sanitary units.—Cherry-Burrell Corp., Cedar Rapids, Ia. **(216)**

INDUSTRIAL LUBRICANTS. Outlines firm's complete line, including tips on a program to streamline industrial lubrication and cut costs as well. 16p.—The Pure Oil Co., Palatine, Ill. **(217)**

"FIBERCAST" PIPE. Describes a centrifugally cast, thermoset epoxy resin, glass fiber reinforced pipe, developed to handle special pressure and corrosion problems. 12p.—The Youngstown Sheet & Tube Co., Youngstown, O. **(218)**

VALVES COUPLINGS. Simplified selection guide of quick connect/disconnect units covers 500,000 combinations with application data and details on types of seals to be used with fluids at various temperature limits. 61p.—Snap-Tite Inc., Union City, Pa. **(219)**

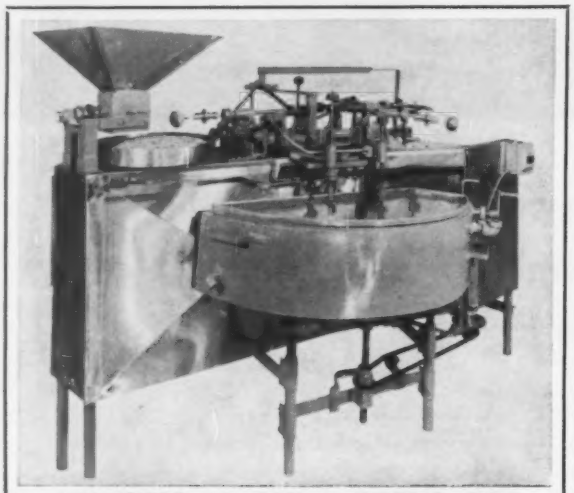
INSTRUMENTS

GAS CHROMATOGRAPH. Introduces a detection system of thermal conductivity filament type, with fast response full-flow cell geometry, and a sensitivity 10 to 20 times greater than most filament-type detectors. 14p.—Beckman Instruments, Fullerton, Calif. **(278)**

IN-LINE CHECKWEIGHERS. Outlines accuracy features, speed, and weight ranges of complete line, including construction data, applications, and illustrations. 8p. —Toledo Scale Corp., Toledo, O. **(279)**

PRECISION SWITCHES. Describes several types for dependable, precision, snap-action switching in both high and low temperature extremes. 4p. — Micro Switch, Freeport, Ill. **(280)**

LIQUID DENSITY GAUGES. Introduces a new process system that provides continuous measurement of solu-



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tion or slurry density directly in process pipe without contacting material and without moving parts. 6p.—Nuclear-Chicago Corp., Des Plains, Ill. **(281)**

PRESSURE-VACUUM CONTROLS. Provides engineering data on spring-loaded, bellows operated, pressure-vacuum units whose simplicity of principle and design makes for ruggedness, accuracy, and versatility. 6p.—United Electric Controls Co., Watertown, Mass. **(282)**

PROCESSING

FREEZE-DRYING. A full line of production, lab, and pilot plant systems, tailor-made to your needs, is illustrated and described with data on firm's complete freeze-drying service based on your potential equipment requirements. 6p.—Vacudyne Corp., Chicago. **(225)**

RADIANT HEATING. Explains principle of radiant heat and describes equipment line designed for utilization of electric infrared process for safe, clean, efficient, and controllable heating. 8p.—Fostoria Corp., Fostoria, O. **(226)**

EVAPORATORS & CRYSTALLIZERS. Comprehensive line is described, including characteristics, suitability for various liquids and end products, and operations. 32p.—Blaw-Knox Co., Buffalo, N.Y. **(227)**

CONTINUOUS FOOD FREEZING. Shows how production system utilizes chilled air at high velocity, holds it at uniform temperature and full capacity, and keeps constant by automatic removal of airborn moisture, preventing freezer frost formation. 4p.—Niagara Blower Co., NYC. **(228)**

CENTRIFUGES. Series of self-cleaning units are described and illustrated with broad application data for any liquid feed with high solids content. 8p.—De Laval Separator Co., Poughkeepsie, N. Y. **(229)**

MIXERS. New double ribbon unit with advanced features is detailed with handy reference engineering constants and short cut tables for unit's operation. 8p.—First Machinery Corp., Brooklyn, N. Y. **(230)**

CONTROLLED LIQUID & SOLID FEEDING. Comprehensive bulletin on feeding, weighing, blending, and proportioning equipment for feeding of liquids and solids includes illustrations and engineering data. 8p.—B-I-F Industries, Providence, R. I. **(231)**

HAMMER MILLS. Full line of units from 20 to 150 HP are catalogued with cutaway views graphically showing construction details. 4p.—Sprout, Waldrin & Co., Inc., Muncy, Pa. **(232)**

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PACKAGING

CUSHIONING WRAP. "Xan-Pak," a new, resilient, light weight, lint-free, non-abrasion, non-slip cushioning materials, made from extruded polystyrene foam, is described with samples. 4p.—Sun Chemical Corp., Ellenville, N. Y. **(239)**

POLYETHYLENE CONTAINER COLLAPSE. Problems encountered in permeation, swelling, instability to oxygene & light, solution of gases into product, and hot filling, are detailed with corrective measures.—Grace Plastics, Clifton, N. J. **(240)**

CORRUGATED SHIPPING CONTAINERS. Provides information on container quality through detailed discussion of manufacturing techniques from raw material to finished product. 20p.—Hoerner Boxes Inc., Cedar Rapids, Ia. **(241)**

ADHESIVES. Pick-up, lap-end, spot labeling, glass labeling, and case sealing types are explained with full technical details on dwell time, viscosity, tack, pot life, and clean-up instructions.—H. B. Fuller Co., St. Paul, Minn. **(244)**

(Turn Page)

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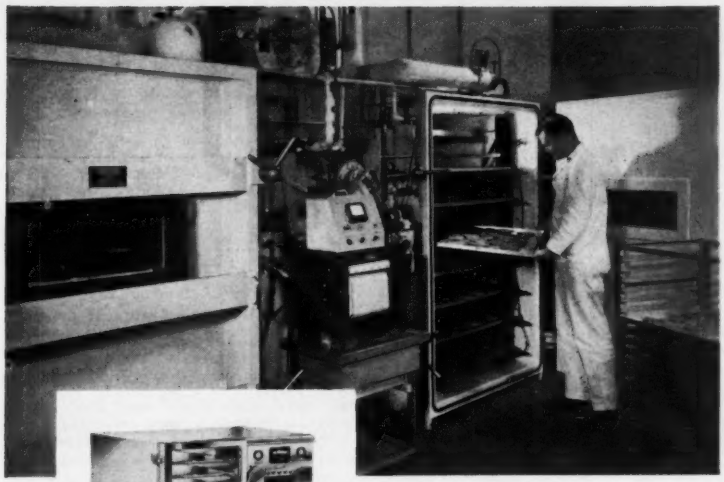

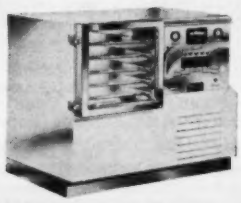

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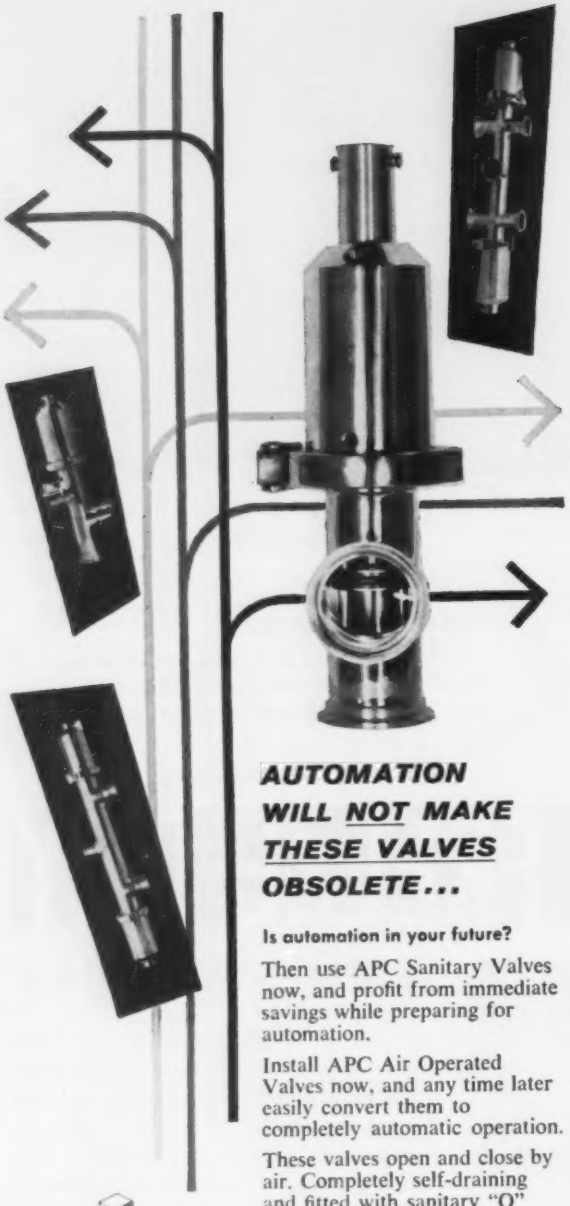

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REUSE CONTAINERS. Illustrates complete line of promotional types especially designed as fancy gift containers for fruit cakes, biscuits, fancy food specialties, and confectionery.—Promotional Container Co., Newark, N. J. **(245)**

STAPLING MACHINE. Contains data on new space-saving unit with load capacity of 10,000 staples for increased carton closing production. 4p.——International Staple & Machine Co., Herrin, Ill. **(246)**

TABLE TOP LABEL PRINTER. Introduces a new unit that produces pressure-sensitive labels on-the-spot—fast and automatically. 4p.—Adhesive Label Corp. of America, Milwaukee, Wis. **(247)**

CLOSER/LINER CAN END FEEDS. Completely describes various models of specially developed closer/liner feeds to handle full range of ends from 202 thru 609 dia. 4p.—Trans-Mation Systems, Bell, Calif. **(248)**

PNEUMATIC STEELSTRAPPER. Illustrates and describes unit—a fully powered hand tool which tensions, seals, and cuts steel strapping. 8p.—Acme Steel Co., Chicago. **(249)**

CASE & BAG CHECKWEIGHER. Shows how new unit performs automatic checkweighing, classifying, and recording of filled cases and bags in any weight from 25 to 150 lbs. 2p.—The Exact Weight Scale Co., Columbus, O. **(252)**

CASE PACKER. Introduces newly developed unit that packs any type of container (glass, metal, plastic, or paper) in efficient, compact, simple operation with trouble-free performance. 4p.—Miller Hydro Co., Bainbridge, Ga. **(253)**

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SEWAGE TREATMENT. Describes and illustrates design and operating features, installation practices, and other aspects of new dependable, economical method of complying with state and local health regulations. 12p.—Dorr-Oliver Inc., Stamford, Conn. **(251)**

PEST CONTROL SPRAYING EQUIPMENT. Complete presentation of spray nozzles, spray tips, hand valves, spray guns, etc., for dependable, effective service, includes illustrations. 8p.—Spraying Systems Co., Bellwood, Ill. **(254)**

DUST CONTROL. Number of effective methods for control of industrial dust and fumes are described with lists of basic essentials for typical system. 20p.—Pangborn Corp., Hagerstown, Md. **(255)**

FLOOR SEALER. Details "Pliocon," a "water-white" liquid that penetrates deep into concrete floors, hardening, dustproofing, and sealing pores for effective control of dust, oils, greases, and chemicals. 2p.—The Monroe Co. Inc., Cleveland. **(256)**

COMPRESSED AIR FILTER. Introduces unit that removes condensed moisture, oil, and pipe scale from compressed air lines in a two-stage cleaning cycle. 4p.—R. P. Adams Co. Inc., Buffalo, N. Y. **(257)**

PLASTIC COATING. Describes a medium priced corrosion resistant plastic coating for exterior or interior metal surfaces. 4p.—Pfaudler Permutit Inc., Rochester, N. Y. **(258)**

GERMICIDES. Discusses properties and uses of both crystalline and aqueous forms of quaternary ammonium germicides for effective control of wide variety of microorganisms. 7p.—Rohm & Haas Co., Philadelphia. **(259)**

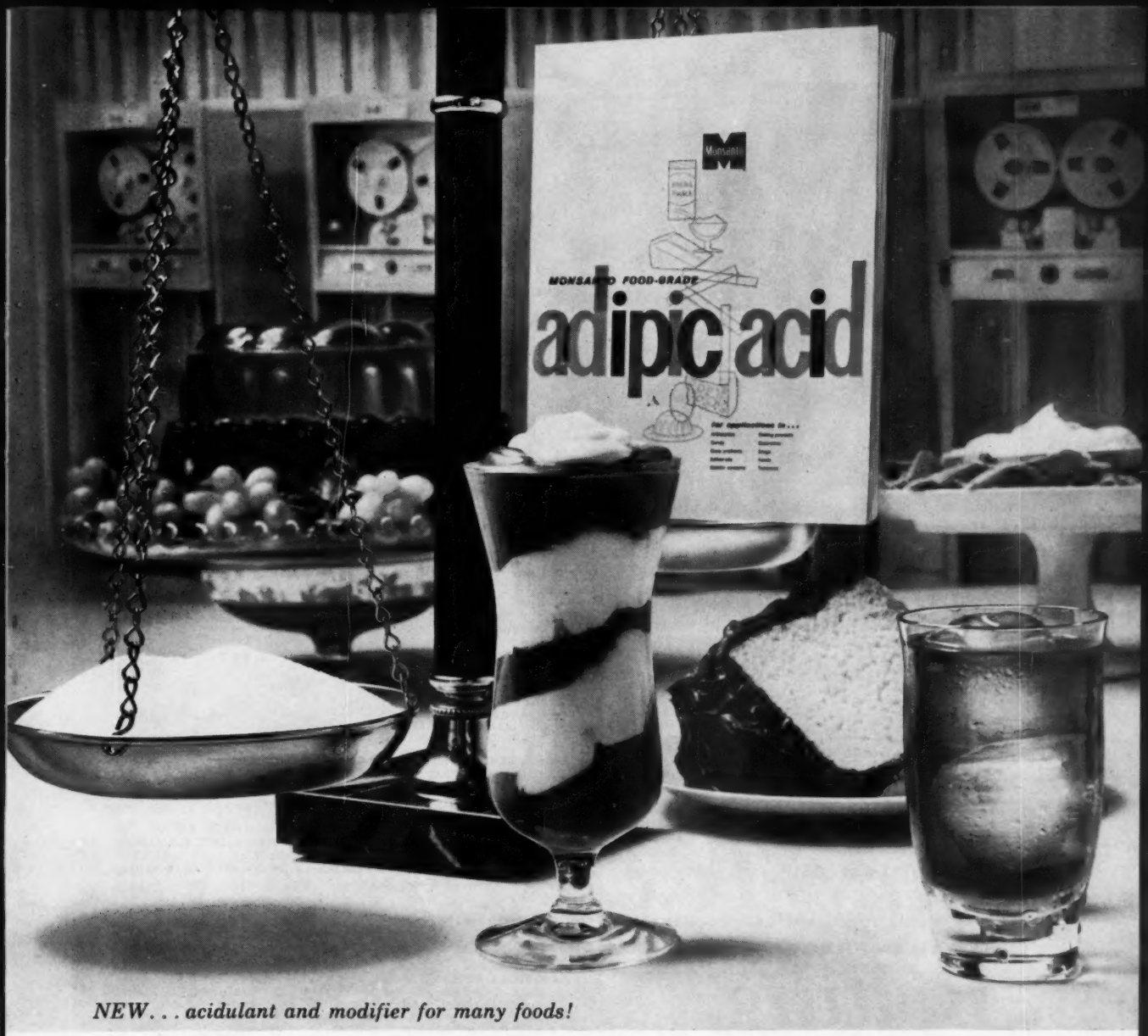
FISHERY SANITATION. Spotlights a wide range of fishery cleaning problems and cites successful methods to conquer them, including photos and technical descriptions. 4p.—Oakite Products Inc., NYC. **(260)**

NICKLE ALLOY COATING. Introduces new method for depositing a uniform, hard, corrosion- and abrasion-resistant surface on iron, copper, aluminum, titanium, and other alloys. 12p.—General American Transportation Corp., Chicago. **(263)**

PLASTIC LINING MATERIAL. New flexible and elastic, corrosion-resistant plastic sheet material is introduced for lining tanks, ducts, and other steel, wood, or concrete equipment. 2p.—Joseph T. Ryerson & Son, Inc., Chicago. **(264)**

FLOOR WAX & WAX REMOVER. Provides information on new type floor protector that contains brighteners, not waxes, for easier application and longer protection; and a new cleaner for de-waxing, especially designed for tough-to-clean floors. 4p.—DuBois Chemicals, Inc., Cincinnati. **(265)**

(Continued on page 120)



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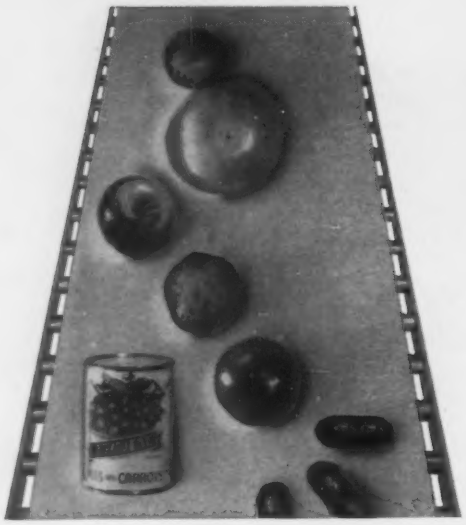

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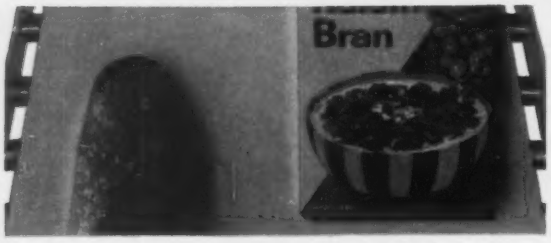

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Just Off The Press (continued)

INGREDIENTS

PIPERESIN. Describes a unique new product, composed entirely of natural materials, offered as a complete replacement or as an extender for oleoresin black pepper decolorized. 1p.—Fritzsche Bros. Inc., NYC. **(275)**

FLAVORING SERVICES. Outlines firm's research, raw materials acquisition, technical services, production & distribution, and creation of new and standard flavors and fragrances that help sell products. 16p.—International Flavors & Fragrances, NYC. **(276)**

FERMENTATION NUTRIENTS. Provides detailed description of low cost autolyzed yeast fractions and enzyme hydrolyzed proteins, available in commercial quantities. 10p.—Amber Laboratories, Inc., Milwaukee, Wis. **(277)**

MANAGEMENT

EXPORTS. Details methods of selling in foreign markets with six points to be considered in exporting. Includes probable advantages and disadvantages of exporting with data on exporting under ICA financing. 4p.—Internat'l Cooperation Admin., Washington, D.C. **(301)**

MANAGEMENT REPORTS. Provides a complete list of publications of the Chamber of Commerce of the U. S. including reports on foreign commerce, industrial development, labor relations, taxation, and transportation. 34p.—Chamber of Commerce of the U.S., Washington, D.C. **(302)**

PLANT LOCATION. Belgium, the new industrial center of the European common market, is detailed with information on nation's natural resources, labor force, population, etc., with sidelights on U.S. firms with Belgian subsidiaries. 16p.—Belgian Industrial Information Service, NYC. **(303)**

PLANT TURNOVER & FAILURE. Details conditions which directly affect success or failure of small plants, including economic and location factors, business conditions, etc. 4p.—Small Business Administration, Washington, D. C. **(304)**

FOOD INDUSTRY UNIONS. Memo describes IFT's attitude toward unionization of non-supervisory technical personnel and includes statement of their rights. 4p.—Institute of Food Technologists, Chicago. **(305)**

FILMS

STAINLESS STEEL. A list of films available for borrowing are detailed, including "Miles of Stainless," "Ribbons of Stainless," and "Corrosion." Includes both color and black & white films useful for trade and service group programs, technical societies, and business organizations. 11p.—Allegheny Ludlum Steel Corp., Pittsburgh. **(296)**

MARKETING

CONSUMER PATTERNS. Fourth annual survey of young adult food market by Redbook Magazine shows reader's usage rate of new products, preferences among new and older products, weekly food expenditures, etc. Data broken down according to age groups. 76p.—Redbook Magazine, NYC. **(291)**

MARKETING GLOSSARY. To avoid misunderstandings in the marketing area, pamphlet provides simple explanation of such key phrases as "channel of distribution," "direct selling," "manufacturers agent," "motivation research," etc. 4p.—Small Business Admin., Washington, D.C. **(292)**

DISCOUNT RETAILING. Factual analysis of latest important trend in food retailing—discount houses. Evaluates size of market, problems in selling to discounters, what market will mean to food makers. 8p.—Grey Advertising Inc., NYC. **(293)**

BRAND SURVEY. Consumer analysis of Salt Lake City area lists brand purchase of 59 food-beverage products, including extensive economic and population data on Intermount marketing area. 138p.—Salt Lake Tribune & Desert News, Salt Lake City, Utah. **(294)**

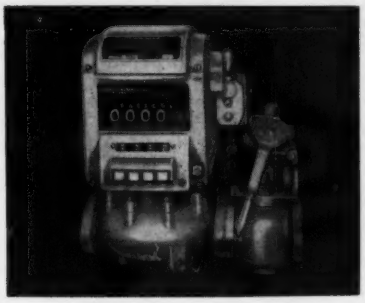
FROZEN FOODS. Survey of wage earning families shows frequency of frozen food purchases, usage, type of item bought, reasons for not buying, etc. 16p.—MacFadden Publications Inc., NYC. **(295)**

Auto-Switch Meter Controls Pumps, Valves, Relays

Neptune Auto-Switch register features an explosion-proof switch which is actuated automatically when any desired quantity of liquid has passed through the meter. The switch can be used to turn pumps on or off, actuate solenoid valves, start agitators, or control other cycling operations by use of suitable relays, etc. which can be devised.

The Auto-Switch feature is available either with or without the mechanically coupled Auto-Stop valve.

In a typical example using the Auto-Switch Register with Auto-Stop valve, the operator clears the



register back to zero, and sets the register for the required number of gallons or pounds of liquid ingredient to be delivered to a kettle or mixing tank. He then opens the coupled Auto-Stop valve to start the cycle. This also closes (or opens) the switch. When the desired quantity has been delivered, the meter automatically trips the valve shut, and at the same time actuates the electric switch.

Gauge-Stick Errors of ⅛ in. Can Cost Thousands of Dollars

Inaccurate liquid measurements can add up to thousands of dollars a year in wasted materials, time, effort, to say nothing of lowered quality.

For instance, it's a tough job to read a gauge stick down inside a 4-ft. tank, particularly when the tank is being filled with hot steamy liquids, or when the liquid is swirling around. Yet an error of just ⅛ in. means that *one gallon too much or too little* has gone into the tank. This *can* add up to thousands of dollars in wasted batches in the course of a year's production.

For formula-perfect batches time after time, get rid of the stick and put a Neptune Auto-Stop meter in every liquid line leading to the blending tank or kettle.

How Neptune Syrup Meter

PAID OFF TWO-TO-ONE

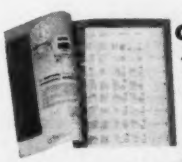
in first year at J. Hungerford Smith

By permitting purchases of caramel color at tank-car prices, a complete storage and metering system paid for itself twice over in materials costs alone during the first summer. And this is only part of the savings made by J. Hungerford Smith Company, manufacturer of fine root beer flavors.

Formerly, the caramel color was purchased in drums, requiring much man-handling and storage space. It took a man full time to measure the syrupy material with buckets. Now it takes only a few seconds for each batch. The operator simply sets up the Auto-Stop and opens the valve. The meter does the rest... shuts off automatically at the exact quantity required by the formula. The meter even turns the pump on and off.

Biggest advantage of all, according to Mr. W. Carvel Martin, plant manager: "It takes the guesswork out of the formula."

You can make savings like this in your plant.



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Useful New Books

Ice Cream Handbook

ICE CREAM AND RELATED PRODUCTS *by J. H. Frandsen and W. S. Arbuckle. The AVI Publishing Co., P.O. Box 388, Westport, Conn. 1961. 360p. Price: $10.50.*

Here is a fascinating chronology going back to earliest beginnings of the industry. Volume provides a careful discussion of all the separate ingredients, their relations and reactions on one another, a thorough explanation of the calculation of mixes and lucid directions with examples for solving all possible problems in formulating and modifying mixes. There is also a complete description of modern practice in large and small scale manufacture including the last word in automation. Fancy frozen desserts are dealt with in great detail and laboratory analytical methods are well covered.

Water Treatment Methods

INDUSTRIAL WATER TREATMENT *by Eskel Nordell. Reinhold Publishing Corp., 430 Park Ave., NYC 22. 598p. 1961.*

Here's the second edition of the book that reviewers hailed as "of great practical value," providing standard practices that are so completely covered that it leaves little more to be desired.

This practical book brings water treatment up to date, discussing the conditioning and treatment of water supplies for industrial usage. Material in this new edition is greatly enlarged and rewritten so as to provide the basic principles involved in, and solution to specific problems. Volume is invaluable to executives, consultants, engineers, chemists, and operating personnel.

College Recruiting

EFFECTIVE COLLEGE RECRUITING *by George S. Odiorne and Arthur S. Hann. Bureau of Industrial Relations, Univ. of Michigan, School of Business Administration, Ann Arbor, Mich. 1961. 288p. Price: $5.00.*

For the first time, you can check your effectiveness against a comprehensive study of the campus-recruiting process. This study highlights the tight manpower situation that makes campus recruiting vital. It presents in a concise manner, a study of the student, his qualifications for employment, and his reactions to the recruiter's interviewing methods, based on 1,134 responses.

If you are in search of graduating students with high ability and potential, and are not finding the people you need, this volume is a must for your bookshelf.

Pressure Pack Data

PRESSURIZED PACKAGING (AEROSOLS) *by A. Herzka and J. Pickthall. Academic Press, 111 Fifth Ave., NYC 3, 1961. 509p. Price: $15.00.*

Here is the first comprehensive reference work to serve the comparatively young pressure pack industry.

Now brought fully up-to-date, the inclusion of new material on compressed gases and formulations employing compressed gases, a section on legal requirements containing regulations, and a bibliography of revelant patents makes this book of great importance.

Book's 21 chapters deal with propellants, containers, valves, filling methods, lab procedures, and emulsified systems.

Booklets & Reports

BLUE BOOK OF AUTOMATIC MERCHANDISING. *National Automatic Merchandising Assn., 7 S. Dearborn St., Chicago 3, Ill.* A complete guide and ready reference to the vending industry — its suppliers, machine manufacturers, operating companies, etc.

HANDLING & MERCHANDISING FROZEN FOOD. *Cooperative Extension Service, Univ. of Mass., Amherst, Mass.* Major emphasis is devoted to retail handling with minor treatment given to processing, transportation, and warehousing.

ANNUAL COFFEE STATISTICS 1960. *Pan-American Coffee Bureau, 120 Wall St., NYC 5. (Booklet No. 24).* Serves as a convenient source of information on world production, distribution, and consumption of coffee and on principle events affecting the industry during calendar year.

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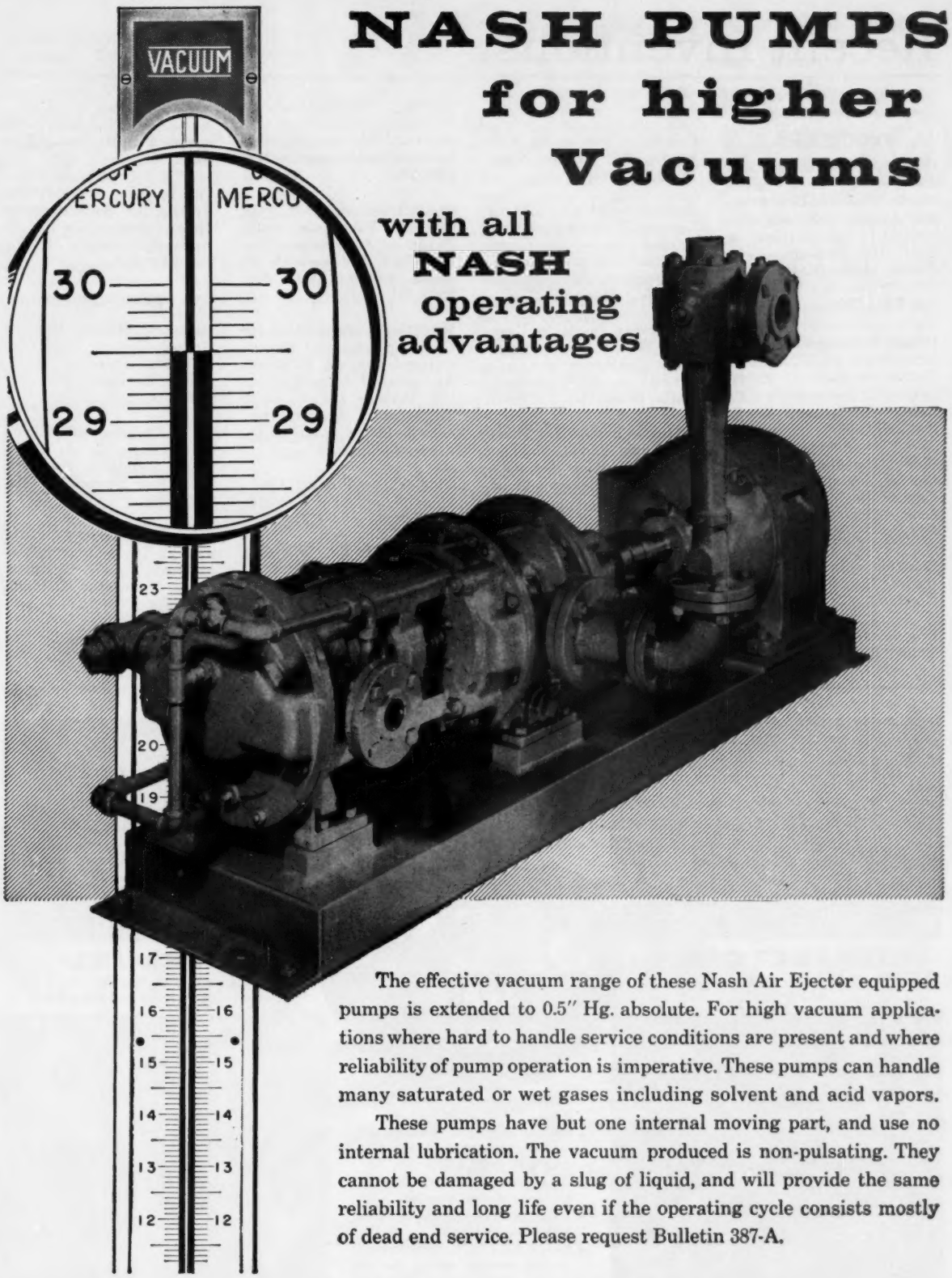
with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

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Recent Inventions

PROCESSING

Method of Collating Cans and Feeding Onto Carton Blanks That Are Overwrapped Around Cans and Interlocked To Complete a Multi-Unit Package. — N. Andre, Andre-Matic Machinery Co., San Francisco. No. 2,974,454.

Using Ultrasonics to Reduce Foam From Aqueous Coffee Extract. — E. H. Lombardi, General Foods Corp., White Plains, N. Y. No. 2,975,056.

Converting Green Tea by Oxygen-Reacting Aqueous Extract of Green Tea With Aqueous Suspension of Bruised Fresh Tea Leaves and Then Heat-Stopping Reaction.—E. Seltzer, T. J. Lipton, Inc., Hoboken, N. J. No. 2,975,057.

Producing Ready-to-Eat Puffed Rice Cereal.—A. L. Colarusso, Van Brode Milling Co., Inc., Clinton, Mass. No. 2,975,058.

Agitating and Aerating Liquors With Oxygen-Containing Gas. — J. White, Fardons' Vinegar Co., Ltd., Birmingham, Eng. No. 2,975,065.

Preserving Foods by Coating With Polymerizable Resin Containing Sorbic Acid. — A. Winterberg, Haifa, Israel. No. 2,975,067.

4-Station System for Steam Blanching and Cooling Foods.—C. M. Ashley, Carrier Corp., Syracuse, N. Y. No. 2,978,325.

2-Stage System for Deodorizing Milk.—H. R. Rasmussen, Aktiebolaget Separator, Stockholm, Sweden. No. 2,978,327.

Freeze-Method of Extracting Meats From Crustaceans.—J. M. Lepeyre, The Peelers Co., Houma, La. No. 2,978,334.

Preparation of Food Preserves by Pulverizing Fruit Juices by Sublimation Under High Vacuum.—O. di Gaeta, Salerno, Italy. No. 2,978,337.

Retorting Canned Meat by Creating Pressure Differential and Venting To Effect Agitation of Product's Liquid Portion for Uniform Temperature Distribution. —L. J. Pircon, AMIF, Chicago. No. 2,979,411.

Flume-Type Product Chiller With Conveyor Containing Spaced Racks Mounted Above Flume.—M. W. Garland, Frick Co., Waynesboro, Pa. No. 2,979,914.

Dough-Product Processing Machine Comprising Means To Compress and Partially Cook Doughs.—M. A. Ramirez, Sr., El Paso, Tex. No. 2,980,012.

Side-by-Side Compartment System for Water-Grading Coffee Beans. — B. M. Aagaard, Kiambu, Kenya. No. 2,980,255.

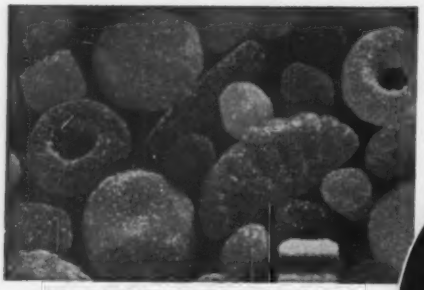
EQUIPMENT

Doughnut Making Machine Having Hopper With Control Discharge. — P. A. Buck, Maitland, Fla. No. 2,974,614.

Onion Topping and Slicing Machine. — L. A. Boles, Basic Vegetable Products, Inc., San Francisco. No. 2,974,699.

Continuous Chopper for Use in High Speed Comminution of Meats.—A. H. Eberman, Oscar Mayer & Co., Madison, Wis. No. 2,974,701.

Machine for Aerating and Refrigerating Readily Sol-



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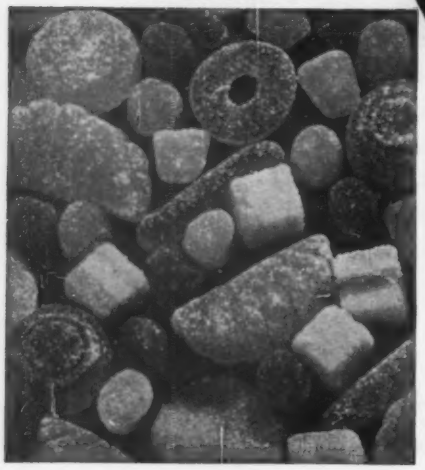

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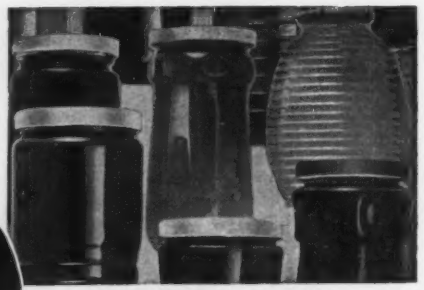

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idifiable Liquid. — A. H. Wakeman, The Creamery Package Mfg. Co., Chicago. No. 2,975,617.

Ultrasonic Comminuting Machine.—D. B. Kececioglu, Allis-Chalmers Mfg. Co., Milwaukee. No. 2,980,345.

Positive Feed Grinding Mill Having Rotor With Upwardly Presented Annular Surface and Stator With Downwardly Presented Annular Surface. — D. J. Brown, Morehouse Industries, Los Angeles. No. 2,980,353.

Apparatus for Sorting Pit-Carrying Drupe Halves From Pit-Free Drupe Halves.—J. Perrelli, Filper Corp., Richmond, Calif. No. 2,981,410.

Machine for Sorting or Sizing Poultry by Weight.—F. F. McQueen, Tuscola, Ill. No. 2,981,412.

Dough-Extrusion Nozzle Containing an Inner Spiral Fluid-Injecting Member.—E. W. Fries, DCA Food Industries, N.Y.C. No. 2,982,231.

Mechanism for Continuously Shaping Straight Candy Sticks Into Canes.—E. Driskell, Bobs Candies, Albany, Ga. No. 2,982,232.

Sanitary-Designed Bakery Rack Comprising Tubular Members Integrally Joined by Welding Means.—M. J. Asproyerakas, Oak Park, Ill. No. 2,982,422.

Device for Injecting Curing Pickle Into Meats and Consisting of a Pair of Reciprocating Heads With Many Hollow Projectable Needles.—H. N. Draudt, Hygrade Food Products Corp., N.Y.C. No. 2,984,170.

Fruit Cutter and Pit-Gripping Apparatus With a Pair of Opening-Closing Type Sharpened Blades Recessed To Receive Pit and Three Parallel Rows of Teeth Secured to Each Blade.—W. A. Erickson, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,984,273.

PACKAGING

Siftproof Compartmented Container Resistant to Passage of Moisture and Gases.—C. H. Turpin, The Pillsbury Co., Minneapolis. No. 2,983,421.

Re-Usable, Pilfer-Proof, Self-Locking Shipping Container.—R. V. Vail, Massillon Container Co., Navarre, O. No. 2,983,423.

Automatic Case Cleaning Machine With Means for Inverting Traveling Cases With Their Flaps Fully Opened.—J. J. Hohenadel, Kulicke & Soffa Mfg. Co., Phila. No. 2,982,985.

Capping Container by Forming Bubble of Tacky Film-Forming Material That's Brought in Contact With Container and Rotating Both To Rupture Bubble. — W. E. Meissner, American Viscose Corp., Phila. No. 2,984,058.

Packaging Bread Loaves With Flexible Wrapper and Applying Sealing Sheet to Wrapper's Folds. — J. E. Smith, Crown Zellerbach Corp., San Francisco, Calif. No. 2,984,573.

Machine for Forming Packages With Tear String.—G. R. Wainwright, Bartelt Engineering Co., Rockford, Ill. No. 2,984,958.

PRODUCTS

Soybean-Oil Dressings of the Non-Pouring Type.—D. Melnick, Corn Products Co., N.Y.C. No. 2,983,618.

Aqueous Based Liquid Food Products Containing Adenine To Stabilize Products Against Off-Tastes Due to Oxidation.—G. H. Kinsman, Basic Products Corp., Milwaukee. No. 2,984,571.

Raisins produced From Raw Grapes Coated With a Silicone Oil. — N. Barsel, Laurelton, N. Y. No. 2,984,572.

Want more information on any of these recent patents—If so you may obtain detailed printed copies by writing direct to The Commissioner of Patents, Washington 25, D. C., giving serial number of those you want and enclosing 25¢ for each copy.

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28 **Aseptic-Thermo Indicator.** Retort tags.
104 **Balcrank.** Reciprocating transfer pump.
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17 **Beckman Instruments.** pH system.
113 **Cherry-Burrell.** Conveying system.
35 **Corn Products.** Sugars, starches, syrups.
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2 **Dragoco.** Spectroscopy.
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75 **FMC.** Packaging machinery, bulletin.
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100 **Flavorex.** Rum flavor, samples.
8 **Fritzsche Bros.** Oil-oleoresin mixture.
5 **Gas Atmospheres.** Generators.
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120 **Globe Woven Belting.** Belting, data book.
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20 **Johnson-March.** Jet spray conditioner.
71 **Kraft Foods.** Sweet whey, spray dried.
29 **Ladish.** Pumps.
92 **LaPorte Mat & Mfg.** Flexible steel conveyor belts.
30 **Malayan Tin Bureau.** Lighter, thinner tinplate.
84 **Merck.** MSG.
4 **Mikro Products.** Pulverizers.
32 **Miles Chemical** Takamine enzymes.
107 **Minneapolis-Honeywell.** Processing instrumentation.
119 **Monsanto Chemical.** Adipic acid, technical booklet.
121 **Neptune Meter.** Meters.
126 **Niagara Blower.** Frostless freezers.
135 **Norda.** Flavors.
72 **Oakite Products.** Mechanized sanitation, bulletin.
109 **Olin.** Cartons.
23 **Owens-Illinois.** Corrugated boxes.
108 **Pfaudler Permutit.** Rotary piston fillers.
83 **Phillips Chemical.** Plastic containers.
102 **Pneumatic Scale.** Automatic packaging equipment.
110 **Resina Automatic Machinery.** Automatic screw capper.
115 **Rheem.** Centrifugal pail lining process.
27 **Riegel Paper.** Plastic coating.
94 **Rohm & Haas.** Enzymes, samples.
11 **St. Regis Paper.** Hickory-smoked yeast, sample.
148 **Sarco.** Automatic cooling control.
36 **Sarco.** Steam traps.
147 **Sarco.** Strainers.
26 **C. G. Sargent's Sons** Food dryers.
124 **Speas.** Apple pectins.
125 **Steelcote.** Epoxy floor covering.
1 **Gebr. Stork.** Sterilizer.
101 **Strahman Valves.** Valve, catalogue.
19 **Sunkist Growers.** Lemon juice.
13 **Taylor Instrument.** Control systems, catalogue.
122 **Thayer Scale.** Automatic scale controls.
16 **Thermovac.** Sanitary pumps & clamps.
127 **Triangle Package Machinery.** Packaging machinery.
22 **Toledo-Edison.** Plant locations.
28 **U. S. Steel.** Metal conveyor belts.
14 **Urschel Laboratories.** High speed cutting equipment.
117 **Vacudyne.** Freeze-dry system.
96 **Vilter Manufacturing.** Refrigeration, bulletin.
76 **Warner & Jenkinson.** Vanilla flavor.
105 **R. D. Webb.** Cocoanut flavor.
114 **Werner Machinery.** Baking equipment.
54 **West Carrollton Parchment.** Vegetable parchment.

Product or Service Category Listing

Cleaning & Sanitation

55 **Dry acid cleaner.** E. I. du Pont de Nemours.
255 **Dust control.** Pangborn.
260 **Fishery sanitation.** Oakite Products.
259 **Germicides.** Rohm & Haas.
452 **Lubricant Cleaner.** Borden Special Products.
72 **Mechanized sanitation.** Oakite Products.
254 **Pest control spraying equipment.** Spraying Systems.
451 **Power Sprayer.** Hayes Spray Gun.
106 **Sanitation survey.** Du Bois Chemicals.

Coating Equipment

116 **Caramel apple machine.** Beatrice Caramel Apple.

Name .....Title .....

Company .....

Address .....

City .....Zone .....State .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

Please send me further information on the items circled below—

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Where ads offer more than one item, I've written key number and identity below

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OCTOBER 1961
Expires Dec. 31, 1961

IMPORTANT MUST INFORMATION

Please check in A & B below best description

A—Your Function

- ☐ 1. Corp. or Admin. Mgmt.
- ☐ 2. Plant Operat. Mgmt.
- ☐ 3. Tech. or Eng. Mgmt.
- ☐ 4. Other

B—Principal Product

- ☐ 1. Baked Goods
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods

FE 98

←CHECK ***Important Must Information***

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

Disintegration Equipment

14 **Cutting equipment.** Urschel Laboratories.
232 **Hammer mills.** Sprout, Waldron.
4 **Pulverizers.** Mikro-Products.

Dry Separation Equipment

147 **Strainers.** Sarco.

Electrical Equipment

280 **Precision switches.** Micro Switch.
215 **Wound rotor motors.** Louis Allis.

Heat Processing Equipment

114 **Baking equipment.** Werner Machinery.
403 **Cooker-cooler.** Chester-Jensen.
226 **Radiant heating.** Fostoria.
1 **Sterilizer.** Gebr. Stork.

Ingredients & Additives

119 **Adipic acid.** Monsanto Chemical.
124 **Apple pectins.** Speas.
465 **Egg Solids Blend.** Armour.
94 **Enzymes.** Rohm & Haas.
277 **Fermentation nutrients.** Amber Laboratories.
105 **Flavor, coconut.** R. D. Webb.
111 **Flavor, raspberry.** Firmenich & Cie.
100 **Flavor, rum.** Flavorex.
76 **Flavor, vanilla.** Warner & Jenkinson.
276 **Flavoring services.** International Flavors & Fragrances.
79 **Flavors.** Dodge & Olcott.
138 **Flavors.** A. E. Illes.
136 **Flavors.** International Flavors & Fragrances.
135 **Flavors.** Norda.
11 **Hickory-smoked yeast.** St. Regis Paper.
464 **Lactose Edible.** Foremost Dairies.
19 **Lemon juice.** Sunkist Growers.
84 **MSG.** Merck.
466 **Maprofix ED.** Onxy Chemical.
90 **Monoglycerides.** Distillation Products Industries.
8 **Oil-oleoresin mixtures.** Fritzsche Bros.
112 **Silicone defoamers.** Dow Corning.
56 **Starches & syrups.** Hubinger.
35 **Sugars, starches, syrups.** Corn Products.
71 **Sweet whey, spray dried.** Kraft Foods.
32 **Takamine enzymes.** Miles Chemical.
80 **Vegetable protein flavoring agent.** Hercules Powder.

Lubrication

217 **Industrial lubricants.** Pure Oil.

Management Services

294 **Brand survey.** Salt Lake Tribune & Desert News.
291 **Consumer patterns.** Redbook Magazine.
293 **Discount retailing.** Grey Advertising.
301 **Exports.** International Cooperation Administration.
305 **Food industry union.** Institute of Food Technologists.
295 **Frozen foods.** MacFadden Publications.
302 **Management reports.** U. S. Chamber of Commerce.
292 **Marketing glossary.** Small Business Administration.
304 **Plant turnover & failure.** Small Business Administration.

Materials of Construction & Fabrication

454 **Ceiling Panel.** Armstrong Cork.
125 **Epoxy floor covering.** Steelcote Mfg.
256 **Floor sealer.** Monroe.
201 **Foam insulation.** Dow Chemical.
263 **Nickel alloy coating.** General American Transportation.
213 **Pipe insulation.** Cunningham & Walsh.
275 **Piperesin.** Fritzsche Bros.
258 **Plastic coating.** Pfaudler Permutit.
264 **Plastic lining material.** Jos. T. Ryerson & Son.
296 **Stainless steel.** Allegheny Ludlum Steel.
453 **Styrocrete.** Dow Chemical.

Materials Handling

120 **Belting.** Globe Woven Belting.
203 **Carton handling system.** Standard Conveyor.
113 **Conveying system.** Cherry-Burrell.
46 **Conveyor belts, flexible.** B. F. Goodrich.
92 **Conveyor belts, flexible steel.** La Porte Mat & Mfg.
28 **Conveyor belts, metal.** U. S. Steel.
405 **Conveyor belts, polyester.** International Ultrasonics.
407 **Roller-curve units.** Rapids-Standard.
202 **Vibrating screw feeder.** Vibra Screw Feeders.

Measurement & Control

413 **Automatic burette.** Scientific Glass Apparatus.
252 **Case & bag checkweigher.** Exact Weight Scale.
414 **Cell disrupter, ultrasonic.** Will.
34 **Checkweighers.** Illumitronic Systems.
13 **Control systems.** Taylor Instrument.
231 **Controlled liquid & solid feeding.** B-I-F Industries.
82 **Conveyor controls, transistorized.** Genisco.
278 **Gas chromatograph.** Beckman Instruments.
279 **In-Line checkweighers.** Toledo Scale.
281 **Liquid density gauges.** Nuclear Chicago.
121 **Meters.** Neptune Meter.
404 **Model UWR-1.** Illumitronic Systems.
17 **pH system.** Beckman Instruments.
282 **Pressure-vacuum controls.** United Electric Controls.
107 **Processing instrumentation.** Minneapolis-Honeywell.

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FE 98

Name .....**Title** .....

Company .....

Address .....

City .....**Zone** .....**State** .....

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99 **Retort tags.**
Aseptic-Thermo Indicator.
122 **Scale controls, automatic.**
Thayer Scale.
411 **Scan-A-Fax.**
Fairchild Camera & Instrument.
412 **Viscometer, recording.**
Viscosel.
2 **Spectroscopy.** Dragoco.

Mixing Equipment

20 **Jet spray conditioner.**
Johnson-March.
230 **Mixers.** First Machinery.

Moisture Removal

227 **Evaporators & crystallizers.**
Blaw-Knox.
26 **Food dryers.**
C. G. Sargent's Sons.
117 **Freeze-dry system.** Vacudyne.
225 **Freeze-drying.** Vacudyne.
233 **Vacuum dryers/blenders.**
Paul O. Abbe.

Packaging Equipment

253 **Case packer.** Miller Hydro.
48 **Case sealer, automatic.**
A-B-C Packaging Machine.
115 **Centrifugal pail lining.** Rheem.
248 **Closer/liner can end feeds.**
Trans-Mation Systems.
406 **Date-price imprinter.**
Adolph Gottscho.
408 **Filling machine.**
Ekco-Alcoa Containers.
6 **Flexible filler.** FMC.
401 **Formline machine.**
Formed Container.
137 **Imprinting attachment.**
Adolph Gottscho.
409 **Ink cartridge.** Esterbrook Pen.
247 **Label printer, table top.**
Adhesive Label.
410 **Oscillating sluices.** Duriron.
58 **Packaging equipment.**
Ekco-Alcoa Containers.
102 **Packaging equipment, automatic.**
Pneumatic Scale.
75 **Packaging machinery.** FMC.
127 **Packaging machinery.**
Triangle Package.
108 **Rotary piston fillers.**
Pfaudler Permutit.
110 **Screw capper, automatic.**
Resina Automatic Machinery.
246 **Stapling machine.**
International Staple & Machine.
249 **Steelstrapper, pneumatic.**
Acme Steel.

Packaging Materials

244 **Adhesives.** H. B. Fuller.
315 **Carton.** Bestpack.
312 **Carton, disposable.**
Bemis Bros. Bag.
314 **Carton, pictoral.** Riegel Paper.
109 **Cartons.** Olin.
245 **Containers, reuse.**
Promotional Container.
239 **Cushioning wrap.** Sun Chemical.
318 **Gloss wax finish.** Weyerhauser.
316 **Overwrap.** KVP Sutherland.
27 **Plastic coating.** Riegel Paper.
83 **Plastic containers.**
Phillips Chemical.
313 **Plastic netting.** Du Pont.
311 **Polyethylene bag.** Dow Chemical.
240 **Polyethylene container collapse.**
W. R. Grace.
317 **Serpentine divider.**
Anaconda Aluminum.
30 **Tinplate.** Malayan Tin Bureau.
54 **Vegetable parchment.**
West Carrollton Parchment.

Pipes, Valves, Fittings & Spray Nozzles

212 **Directional control valves.**
Oilgear.
221 **Gate valves.** Lunkenheimer.
218 **Fibercast pipe.** Fibercast.
216 **Fittings & valves.**
Cherry-Burrell.
214 **Metal hose, flexible.**
Atlantic Metal Hose.
16 **Pumps & clamps, sanitary.**
Thermovac.
220 **Spray nozzles, pneumatic.**
Spraying Systems.
36 **Steam traps.** Sarco.
101 **Valve.** Strahman Valves.
219 **Valves, couplings,** Snap-Tite.
118 **Valves, sanitary.**
Creamery Package.

Plant Air Conditioning & Refrigeration

148 **Automatic cooling control.**
Sarco.
257 **Compressed air filter.**
R. P. Adams.
96 **Refrigeration.** Vilter.

Plant Services

455 **Chemical Ice Melter.**
Chem Industrial.
265 **Floor wax & wax remover.**
Du Bois Chemicals.
251 **Sewage treatment.** Dorr-Oliver.

Plant Site

303 **Plant location.** Belgian Industrial Information Service.
22 **Plant locations.** Toledo-Edison.

Power Transmission

69 **Chain drives.** Dodge.

Product Freezing Equipment

228 **Continuous food freezing.**
Niagara Blower.
126 **Frostless freezers.**
Niagara Blower.

Pumps & Air Compressors

222 **Canned pumps.** Allis Chalmers.
29 **Pump.** Ladish.
104 **Reciprocating transfer pump.**
Balcrank.

Shipping Containers

23 **Corrugated boxes.** Owens-Illinois.
241 **Corrugated shipping containers.**
Hoerner Boxes.
402 **Plastic-lined steel drums.**
Redmanson.

Steam & Power Generating Equipment

211 **Gas burners.** Selas Corp.
5 **Generators.** Gas Atmospheres.
10 **Stop & go diesels.**
Cummins Engine.

Wet Separation Equipment

229 **Centrifuges.** De Laval Separator.
52 **Diatomite filtration.**
Johns-Manville.

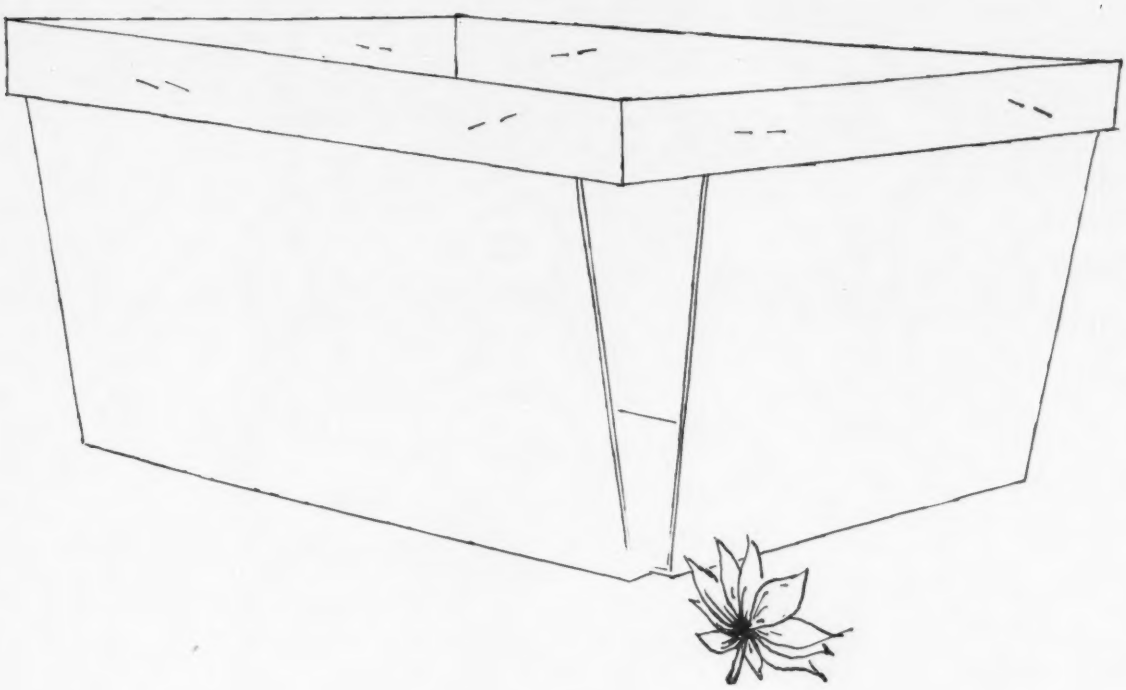
CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS
PERMIT NO. 23708
PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

POSTAGE WILL BE PAID BY
FOOD Engineering

The Computer Center
P.O. Box 1970, Camden 1, N. J.

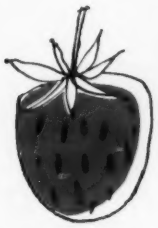


When all is said and done...

...NOTHING

TASTES SO TRUE

TO NATURE



Norda®

Flavor it with a favorite

Exclusive Basic Materials for: Candy and Chewing Gum, Dairy Products (Ice Cream and Cheese), Soft Drinks, Desserts (Puddings and Gelatins), Meat Products, Syrups, Bakery Products (Cake Mixes, Crackers, Snack Items), Pharmaceutical Products, Liquors and Cordials.

Write on your letterhead for free samples.

NORDA, 601 W. 26 St., New York 1, N.Y. • Chicago • Los Angeles • San Francisco • Toronto • Montreal • Havana • London • Paris • Grasse • Mexico City

CIRCLE 135 ON INQUIRY CARD

CIRCLE 136 ON INQUIRY CARD →

AN INSIDE LOOK AT FLAVORS THAT SELL

Look closely at any successful flavored product—nutritional supplements for weight control, cereals, beverages or one of many foods consumed daily. Taste it . . . compare it. Why is it some flavors have compelling consumer appeal?

IFF flavors sell and resell for two important reasons. They are exclusively designed for your product, your markets—and they are the finest flavors available. *IFF* flavors have created new product lines, improved established ones and stimulated brand-building sales the world over.

To manufacturers interested in selling abroad, *IFF* can supply your flavor—uniform in taste—from any of its plants throughout the Free World.

For an inside look at flavors designed to sell your products, contact *IFF.*

FLAVOR DIVISION
INTERNATIONAL FLAVORS & FRAGRANCES INC.
417 Rosehill Place, Elizabeth 2, N. J.
Leading Creators and Manufacturers in the World of Flavor